

COMMUNITY HEALTH

TURNER & COLLINS





Class RA 431

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MALDEN HEALTH SERIES

COMMUNITY HEALTH

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PREFACE

This book, like the others in this series, has been produced in the classroom by presentation, adaptation, revision, re-presentation, and further modification. It presents both the social and the personal aspects of community health. Its place is in the seventh or eighth grade, where the child begins to give considerable attention to the subject of civics.

The historical approach — which presents the health problems of early settlers in America, the difficulties of those pioneers who undertook the western migration, the development of rural life, and finally the development of urban life — has many advantages. It provides a natural presentation of country as well as city health problems, of rural as well as municipal sanitation. It presents a perspective of the changes in the mode of living during the last few generations, and, what is perhaps more important, it allows the pupil to see the origin and need of town and city government in the maintenance of health.

The health-education program at this grade level regards continued training in the habits of healthful living as a primary objective. Many subjects and school activities should contribute to this end. It is often as difficult for a child to maintain a specific habit at this age as it was for him to establish the habit at an earlier time. The Appendix presents suggestions for the organization

of both class and school activities in the furtherance of positive health and the health-training program.

The authors express appreciation of the continued coöperation of the School Board of the City of Malden and the Department of Biology and Public Health of the Massachusetts Institute of Technology. Particular thanks are due Superintendent F. G. Marshall and the principals and teachers in those junior high schools in which were developed the varied experimental methods and approaches from which, by the selection of the best, this course of study was gradually evolved.

Grateful acknowledgment is also made to Professor F. B. Dresslar of George Peabody College for Teachers, in Nashville, Tennessee, to Mrs. Florence Hobson, teacher of hygiene at the Fairmount Junior High School of Cleveland, Ohio, and to Miss Effie Knowlton, Director of Health Education in Binghamton, New York, who read the manuscript and made many constructive suggestions. We also acknowledge the courtesy of the Walker-Gordon Laboratories, in allowing us to use several pictures of sanitary milk production, and the kindness of the various national organizations and agencies through which desirable illustrations were secured.

People who have used the Malden Health Series have already made the acquaintance of our artist, Mrs. Hazel Ives. The authors feel that her contribution to the value of the book is a large one.

C. E. T.

G. B. C.

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COMMUNITY HEALTH

I

HEALTH

What fun it would be to live for a little while in the land of long ago! How should you like to have been a boy on a Western ranch, or a girl on a beautiful Southern plantation, seventy-five or a hundred years ago? Perhaps you would like to have lived the care-free life of an Indian child in the time before the white men came.

The ways of life were much simpler in those days than they are now. The pioneer boy ate rough natural foods. He lived largely out of doors, playing or helping to provide food and shelter. His play was in the woods or about the yard. He was likely to go to bed early, because his cabin was so poorly lighted that there was little to do after dark, and he had played or worked so vigorously all day that he was too sleepy to stay up late.

One may say that life was more "natural" in those days. People ate the kinds of foods which nature provided, used their bodies in active exercise, lived in the open, and found rest in long hours of refreshing sleep. How different is life today! We eat highly refined foods which man has learned to manufacture from nature's

bounty; we live in heated houses; most grown-ups exercise very little — many people actually sit still all day at their desks; we turn night into day with electricity, while countless activities beguile us into spending the late evening hours at things other than sleep. If one says that life in the pioneer days was simple and natural, he may say that, in contrast, the life of today is complex and artificial.

What bearing does all this have on the matter of health? You may know that animals require special care when they live under artificial conditions. Otherwise they are likely to suffer from illnesses or defects which they would not develop under their natural ways of living. In a book entitled *The Ways of the Circus* there is an interesting description of the care of caged lions. The trainer says he does not give them fat meat, because it will cause boils. He never gives them meat without bones, because they will swallow the meat whole and become ill from indigestion. He is careful not to overfeed them, because that makes them lazy and inactive. If these lions were living in the jungle, there would be no need to worry about their feeding. They could use what little fat meat they got, because they would have so much exercise. They would never have meat without bones, and would always be obliged to tear it in shreds before swallowing it. They would not be in danger of overfeeding, because food is scarce in the jungle and they would need a great deal of nourishment to support their active lives.



THE CAGED LION EXERCISES BY STRETCHING

We, living under present-day conditions, are somewhat like the lions in the cage. Highly refined foods and lack of exercise are among the common faults in our scheme of life. We must regulate our habits if we wish to keep our bodies in good health.

Health and hygiene. — The maintenance of health is based upon the study of hygiene. If you look up the words in the dictionary, you will see the difference between the meaning of “hygiene” and the meaning of “health.” “Health” is a condition of the mind and body, whereas “hygiene” is the science of gaining and preserving health.

The Italian Institute of Hygiene has as its motto the

following definition: "Hygiene tends to make growth more perfect, decline less rapid, death more distant, and life stronger and happier." How many things may hygiene do for us according to this definition? Will everybody profit in all of these ways from a study of health and hygiene?

In your dictionary study of the word "health" you will find that it is related to the word "whole." Immediately your mind says: "How fitting! That which is healthy is wholesome!" Indeed, the word "wholesome" describes beautifully the type of person who has abundant health of body and of mind. Who would not choose to be one of this type — good to look upon, cheerful in disposition, intelligent, alert, honest, reasonable in behavior, and capable in work? Such a person is a delight to family and to friends.

Value of health. — You can think of countless reasons why you desire for yourself such a state of health, or "wholesomeness," as that just described. Make a list of the reasons why health seems desirable to you. Compare the various lists from your class and put together a complete list of all the reasons given. Which reasons are most important?

Health is not only a condition of the body; it is equally a condition of the mind. Mind is the gift which sets man apart from the lower animals. Man, therefore, sets greater stress upon the things which have to do with the mind than upon those which have to do merely with the body. The highest reasons for desiring health are those



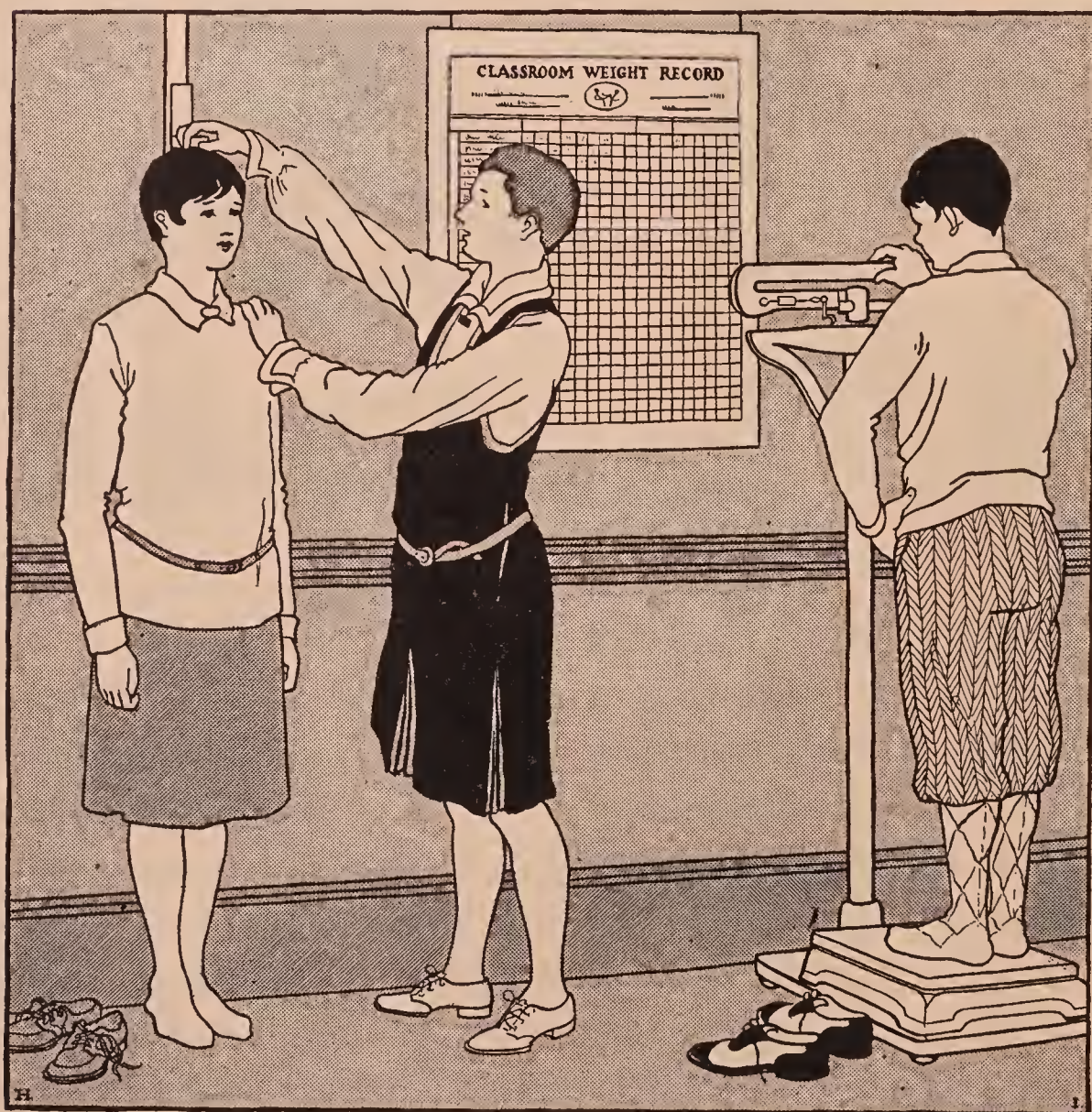
HEALTH GIVES ZEST TO SPORT

which have to do with the development of mind, character, and the opportunity for usefulness. We want health in order that we may be finer men and women; that we may make the most of what nature has given us in mind and body; and that we may enjoy life to the fullest.

Do you sometimes think: "When I am grown up, I shall do this, or that, or the other"? You dream of improving the world. Each one has the right to give something to the world. Is not each individual a person of

importance? No one should neglect the opportunity to acquire the greatest possible perfection of body and mind.

Signs of health. — Perhaps you ask: “How does one know when he has health? And what does one do to possess it?” Why do you not work together as a class to make up a list of the ways in which you can observe health in yourself or in other people? Good posture,



WATCH YOUR GROWTH; IT IS A SIGN OF HEALTH

clear eyes, a clear skin, vigor of voice — these are some of the signs of physical health. What things are to you the signs of mental health? You may start your list with cheerfulness, honesty, and concentration. What other qualities can you add?

One of the most important signs of physical health in boys and girls is growth in height and weight. How much have you gained in the past year? How does your own gain compare with that of other boys or girls of your own age? How does it compare with the average for boys or girls of your age as given in the Baldwin-Wood tables? (See Appendix, pages 253 and 254.)

You are now at the age of most rapid growth. You are no longer children; you are becoming young men and young women. During this time of rapid development in which you are changing from child to adult, you need to direct your ways of living carefully so that you may help yourself to realize the ideals of life and service of which you dream. Your physical condition five years from now is in your own hands more completely than most of you realize. The time for building a house securely and beautifully is during the building time — not after the house is completed. The time for building a strong and beautiful body is during the time of development. Indeed, no amount of patching-up later in life can wholly make up for what you fail to do now.

How does one secure health? — A boy becomes a good baseball player by playing baseball. One becomes gifted with health by playing the health game. There are some

disagreeable things about learning to play baseball, but the fun more than makes up for them. There are some sacrifices to be made in playing the health game, but the satisfaction and joy which come with the possession of health more than offset them. In the health game, as in baseball, one must play with persistence and with honesty; one must keep the rules. One reason why the health game is particularly fascinating is that every one who plays can improve his score.

The rules of the game you know. Here they are as set down by the American Child Health Association:

1. A full bath oftener than once a week.
2. Brushing the teeth at least twice every day.
3. Sleeping long hours with the windows open.
4. Drinking as much milk * as possible, but no coffee or tea.
5. Eating some vegetables every day.
6. Drinking at least four glasses of water a day.
7. Playing part of every day out of doors.
8. A bowel movement every morning.

Add more rules and try to arrange them in the order of their importance as related to health. Check for yourself the ones which you can honestly say you have trained yourself to keep regularly. Look over the other rules and decide which ones you will attack immediately. Get into training and play the game!

This ought to be an important part of your health work this year — just playing the game of health. Most people like to do things better when they work with

* Nutrition experts recommend a quart a day.

others than when they work alone. Should you not like to organize your class in some way so that all of you may undertake your training in health together? Since your particular study for this year is the health of the community, you may like to imitate the Board of Health or Health Department in the city government and organize your personal health work under a Board of Health in your class. In the Appendix you will find suggestions for such an organization and for activities which you can carry on at different times during the year.



HEALTH IS A STEPPING-STONE TO SUCCESS AND HAPPINESS

Your health program. — Your program of health work for the year, then, is divided into two parts: first, a constant effort to attain for yourself the best standards of growth and development; second, an advance in your

knowledge and understanding of present-day problems through your study of community health. You may use alternate lessons for personal health activities and for the study of community health, or you may make some other arrangement which your teacher thinks better. In studying community health do not forget that the first health duty of a good citizen is to be healthy himself.

Every girl wants to be well and attractive; every boy wants to become strong and vigorous — nature intends that they should. Everybody desires to succeed. Is there not opportunity for all? You who would be attractive, you who would be strong and vigorous, you who would succeed — seek health! *Health is what nature gives you plus what you give yourself.* How much are you willing to give?

II

A PIONEER FAMILY

Do you know:

How the life of the pioneer differed from your own?

How the early settlers safeguarded their health?

What precautions were necessary in order to protect the family?

What problems the modern farmer has in keeping a healthful home?

You are all familiar with stories of the covered wagons by which families traveled from the towns of the East to make their new homes in the West. One may picture a family consisting of a man, his wife, and their children — perhaps a boy of sixteen, a girl of thirteen, and several younger children — all sharing this experience of traveling several hundred miles to a new settlement in a new and unknown land.

Usually they led their cows along with them in order to have milk. They might even carry two or three little pigs and some hens. Sometimes they would kill one of these animals for fresh meat, but usually the shotgun or rifle provided this part of the meal from the wild game along the way. A shepherd dog was always a good companion on the journey because he would care for the sheep and guard the camp. When the family reached the section where they expected to settle, the man staked out a

claim, for the land belonged to the government and was given in certain amounts to people who would settle on it.

The building site. — The first problem was to choose the site for building a house. A prime consideration in this selection was the question of water supply, because water is a necessity for life. In some sections good springs were found, and these determined the location of the home. In some cases wells were dug. In constructing



THE PIONEER FAMILY SOUGHT A NEW HOME

a well the wise settler chose a place higher than the land where the house was built, or so located that no waste could drain into it. When completed, the well was walled with stone and tightly covered so that hens, dogs, or people moving about at the top of it could not scatter dirt into it. The careful man thus had drinking water which was pure and a well that could be kept clean.

Another consideration in choosing the location of the home was the nature of the soil. The cabin would be placed on high rather than marshy land. Thus the settler's family would be assured of a home that was dry and removed from mosquito-breeding pools. The man who built on a rise of land in gravel soil was very fortunate, because gravel drains easily and is good land in which to put the underpinning or foundation for a house. He was fortunate, too, if his house was built so that the sun shone upon the long side, making the rooms pleasant and dry and helping to warm the house in winter.

Domestic animals. — The pioneer's next step was to build a stable for the domestic animals — a barn or lean-to or shed. He used hay or straw for bedding. He built a pen for the pigs and a coop for the hens. These animals were useful to the family, not only in furnishing food, but also in using up the kitchen waste.

The wise man was careful about the cleanliness of his cows and the methods of milking. The milk was cooled quickly by hanging the milk pails in the well or setting the pans of milk in the cellar. All milk was kept in a clean place where dirt could not get into it.

The sensible man knew also the importance of using only healthy animals for food. Sick animals were killed and buried in the woods; meat from these animals was not eaten. The meat supply was supplemented by buffalo, hunted on the plains, or bear and deer from the highlands. With his gun the settler shot down vigorous, healthy animals. He bled them properly, dressed each creature, and carried home a larger piece of fresh meat than we ever buy at the market.

Crops. — In the spring he planted a vegetable garden, in clean, fertile soil, at a place where there was no drainage from the barn or toilet. He raised many vegetables, for they were an important part of his food supply. In the summer the garden supplied fresh lettuce, spinach, beet greens, corn, string beans, and cucumbers. In the fall it furnished potatoes, carrots, turnips, cabbage,



GRINDING CORN BY HAND

onions, and other vegetables to be packed away in a dry place for use in winter.

The settler raised his own corn and wheat, too. Sometimes he carried the whole grain to some place at a distance, where he had it ground into coarse meal and flour; sometimes he himself ground it by hand or in some crude grinding machine. All the food supply for the family was raised by the settler himself, and he could guarantee its quality.

Wastes. — There was always the problem of disposing of wastes from the house. The food waste was fed to pigs and chickens, so that it was promptly taken care of without creating a nuisance. There was a sink spout to take the waste water away from the kitchen. If the settler was fortunate enough to be able to cut his own ice in winter and store it for summer, there was an ice chest which had to be drained by a pipe. The water from the washtubs was carried a little way from the house and poured on the ground. There was no bathroom, of course, and the washtubs served as bathtubs once or twice a week. The waste water from the house was carried far enough away so that it would not cause odor or dampness. It was frequently poured over a pile of rocks or upon light gravel soil in a sunny place in order that the water might be dried up and purified by nature.

The pioneer was obliged to build an outdoor toilet, or privy, because he had no running water supply for a bathroom. One way of building such an outhouse was

to dig a deep pit in the ground. He covered the pit tightly so that animals and flies could not get in. He kept the contents of the pit dry by using sand or dry dirt. Such an outdoor toilet was quite satisfactory. The manure from the stable was disposed of by spreading it on the land, where it would become part of the soil.

Keeping well. — Families living in the wilderness were not worried about measles or scarlet fever, or any such illnesses. The children played only among themselves, for there were no other children near enough to play with them. Unless they all went into town for a county fair or a rodeo, they were not likely to catch any communicable diseases, because there was no one from whom to catch them.

In the life of the pioneer all of these various health problems were, for the most part, under his own control. In order to raise good crops and healthy animals, and to take good care of his family, he had to meet these health problems. Of course some men were wiser than others, and consequently provided more successfully for their families. Some were more fortunate, and happened to make choices which were favorable to health. You can easily imagine that a stupid man would fail at pioneering. Only the intelligent and industrious man could bring up a family safely in the wilderness.

Select from this story of the pioneer the things which are related to health and write them down on paper. When we start to study community health we are confronted by many of these same problems. Most of us do

not live on ranches or farms where the control of things is in our own hands. We live in towns or cities and must meet these problems in a different way.

PROBLEMS AND PROJECTS

1. Make a list of all the conditions related to health which are mentioned in this chapter.
2. See which conditions are mentioned most frequently in your classmates' lists. Are they the most important?
3. Discuss the way these problems are met at your home or at some farm or camp where you have been.
4. Answer the questions at the beginning of this chapter.

III

THE HEALTH OF A LARGE COMMUNITY

How much money is spent for health each year in your town or city?

How much is this per person each year?

For what things is this money spent?

Could the taxpayers of your town or city do these things for themselves on the same amount of money?

What health problems are found in cities but not in the country?

Have you ever read *Robinson Crusoe* or *Swiss Family Robinson*? In these stories there were no problems of government. So it was with the pioneers, for their homes were far apart. But as others came, settling nearer and nearer, communities were formed. Then common interests developed, common difficulties appeared. Local government was established.

As you study civics you learn the purpose and nature of government. You may have thought of it as a means of having things done for the people. See if your class can agree upon a definition of government.

Government. — In the Declaration of Independence of the United States there is this statement of the rights of people in government: “ We hold these truths to be self-evident: That all men are created equal; that they are endowed by their Creator with certain unalienable

rights; that among these are life, liberty, and the pursuit of happiness.” These, then, are the recognized rights of each human being: *life, liberty, and the pursuit of happiness*. If one lives alone, like Robinson Crusoe, no one interferes with these rights, but when people live in towns or cities it is fairly certain that some will not regard the rights of others. Some system of government must be formed.

Each person is guaranteed personal liberty, but if he goes beyond his rights and interferes with others the regulations of government compel him to stop. What is meant by the sentence: “Personal liberty ends where the acts of the individual interfere with the public welfare”?

You may ask whether health is part of these “unalienable rights” under government. Is health an important part of life? Surely we are more concerned over the loss of health than over the loss of money. Is health related to happiness? It is possible, of course, to have a large share of happiness without health, but health is a decided aid in the search for happiness.

One duty of government, then, is to protect the health of each citizen. Another function of government is service — that is, doing things for the people. For example, education is provided for all the children of the community. Would it be practicable to hire a separate teacher for the children of each family? It would be very expensive even in a family with three or four children.

The Swiss Family Robinson had to build their own

roads. What a burden it would be if we had to build a road to wherever we wanted to go! It is easy to see that the best way to have good roads is for people to join together and pay for having them built. In the city there is a Street Department. We pay money through taxes, and this department builds better roads than we ourselves could build.

Health problems. — In the country a man either keeps a cow himself or buys milk from a neighbor. He can visit his neighbor's barn and see for himself how the milk is handled. Most of you get your milk from a milk dealer; you cannot go to the farms where the cows are. Your government accepts the responsibility of seeing that the milk is pure and clean.

How many of you get water from your own well? How do you know that the water is pure? In using a city water supply, you cannot see where the water comes from. You rely upon your government to safeguard the water supply.

Do any of you keep pigs and kill them for pork in the fall? How many of the families represented in your class raise chickens? Most of us have to buy meat which comes from a distance. We cannot see for ourselves that it comes from healthy animals.

How many of you buy bakery food? Perhaps you could go into the bakery kitchen and see how the food is cooked, but you are not likely to do so. Some one from the Health Department makes sure that the food is clean and wholesome.



It is quite clear that you and I should be in danger unless some one did these things which are necessary to safeguard our health. The branch of the government which does this work is the Board of Health or Health Department.

If you review the things which are important in maintaining the health of the home, you will see that there

are similar problems in keeping a city clean and well. Look over the following list of problems which have to be met in both country and city. Discuss the way these problems differ in the country and in the city.

PROBLEMS OF CLEANLINESS

1. Securing clean and wholesome food.
2. Securing clean water.
3. Providing sewage disposal.
4. Removing ashes, rubbish, and kitchen waste.
5. Avoiding dust and smoke.
6. Preventing rat nuisance, mosquito nuisance, and fly nuisance.
7. Securing proper bathing facilities.

PROBLEMS OF DISEASE PREVENTION

1. Providing immunization against smallpox, diphtheria, and some other diseases.
2. Preventing the spread of disease.

PROBLEMS OF PROVIDING RECREATION

1. Giving opportunity for games and sports.

PROBLEMS OF COMFORT

1. Securing comfortable housing.
2. Securing proper heating and ventilation in public buildings.
3. Securing proper lighting in public places.

PROBLEMS OF SAFETY

1. Control of fires.
2. Control of traffic.
3. Police protection.

In addition to the health problems which exist in both the country and the city, there are certain problems which are peculiar to the city alone. There is, for example, the problem of city planning. A well-arranged



A TYPICAL GROUP OF CITY BUILDINGS

city cannot grow up without a plan any more than a good house can be built without one. The streets must be laid out properly. Some cities have made a wise provision by planning for the kind of building to be done in different parts of the city. One section of the city is set aside for factories and large business buildings, while another part is set aside for homes. Such a plan is usually called a Zoning System.

To maintain the health of a large community is a complex problem. In meeting this problem there is a double responsibility: (1) that of the city government to render sound, scientific, faithful, and honest service; (2) that of all citizens to give loyal and intelligent support. Will you do your part?

PROBLEMS AND PROJECTS

1. Why is it worth while to spend tax money upon health?
2. What divisions in the city government do things which are related to health?
3. What kinds of health work does your city do?

IV

WATER SUPPLY

Is life possible without water?

How is it possible for mold spores to stay alive in dry dust?

Is there any plant or animal which can *grow* without water in some form?

What are the uses of water on a farm?

What are the uses of water in a city?

What would happen in the place where you live if there were no water for two weeks?

What kind of water is necessary for drinking purposes?

How much water does your city use each day?

How does a big city get a satisfactory supply of drinking water?

Importance of water. — Water is a necessity for health. Indeed, nothing can live without it. The body itself is about two-thirds water; the soft parts of the body, like muscle and brain, are three-fourths water. Every living thing contains a high percentage of water.

Spores of mold can stay alive in dry dust because a thick wall is formed around the living substance. This wall prevents the small amount of water from drying out. Mold plants cannot *grow*, however, until a spore gets back to a place which is warm and moist. You have noticed how grass and flowers freshen up and grow when there has been rain for a few days. Abundance of water is one

of the first essentials for maintaining a healthy plant or animal.

“ Drink at least four glasses of water a day ” is one of the first health rules you learned to practice. By now you have probably increased the amount to six glasses or more each day. You have learned that the circulation of fluids in the body is one of the most important activities which go on in the human mechanism. These fluids bring food and oxygen to the tissues and carry away the waste products. You have seen the importance of water to good digestion and proper use of food by the body. It has been shown that man can live for a month or more without food, but he can live only a few days without water. Have you ever read tales of men lost in the desert, without water, or afloat in a small boat at sea without fresh water to drink?

The farmer knows that he must have a good supply of water for his animals, as well as water in the land to make the crops grow. In the city, water is used in hundreds of different ways. It is used for cleanliness about the home, to water the lawn, to wash the streets, to put out fires, to supply power for mills, and to help in many kinds of manufacturing processes. You could prepare a rather long list of the particular uses for water which you have seen in your own town or city.

Selecting a water supply. — Every pioneer in the early days made sure of a good water supply before he started to build his house. How utterly foolish it would be for a man to say that only a few quarts of water a day were

needed for drinking, and that it could be brought to the house from some distant place. Unless water is close at hand and easy to secure, there is danger that people will not drink enough to maintain perfect health; and certainly proper cleanliness is difficult to secure when the supply is scanty.

What quality of water does the pioneer try to secure? Does he wade out through the mud and grass of a swamp until he is knee-deep in water, and then put down a pipe through which he can pump? You recognize this as a silly procedure, of course, but do you know the exact reasons why such a water supply would not be good?

In the first place, swamp water is usually yellow or greenish in color; it may even be somewhat blackened if the soil of the swamp is very dark. You can easily see that water which is colored is neither attractive to drink nor practicable to use for bathing and laundering. The color of swamp water comes from plants which have been soaking in the water and from the muddy soil. This color is not injurious to health, but it makes the water undesirable.

Standing water is often green in color, not from the large green plants which have been growing in it, but from tiny green plants which are floating there. These plants, which are called algæ, are so small that they cannot be seen except through the microscope. They are as harmless as grass, and it probably does us no more harm to drink water in which there are algæ than to eat a very thin vegetable soup. The greenish color is unattractive,

however, and frequently there is an unpleasant odor. When water contains plenty of dissolved food material for these plants they grow in sunlight with great rapidity until there are thousands of them in every cupful of water. There is one variety of alga which has an odor like a rose geranium; another which has a rather grassy odor; others have odors not so pleasant. In looking for a water supply, therefore, we should avoid water from a swamp, because such water is



MICROSCOPIC GREEN PLANTS
IN WATER

likely to have a disagreeable color, taste, and odor.

We should also avoid water which is roily. Have you ever seen roily water? Shallow water is so much disturbed by a hard rain that particles of mud are picked up by it. Such water is said to be roily, or turbid. River water often picks up mud. The Mississippi is spoken of as a turbid river.

Sometimes there are traces of iron in the soil which give the water an iron taste like that of water which has run through new iron pipes. Iron may also give a cloudy yellow color and leave rust spots on clothes when they are washed.

The pioneer, or settler, would refuse swamp water

because of its temperature. In a northern climate the whole swamp would freeze in winter. In warm weather swamp water would be unsatisfactory, too, because it would be so warm that no one would like to drink it.

Water is likely to contain harmful bacteria if it is located where body wastes from men or animals may drain into it. The pioneer would be in little danger of finding polluted water, however, because he would be in a location practically uninhabited.

In selecting a water supply one would look for a spring of clear water bubbling up out of the cool ground of a hillside, or dig a well to bring up the clear, cool water which is slowly moving through the ground at some distance below the surface. This water has soaked through from the surface, of course, but it has been purified by filtering slowly through the deep layers of the clean earth. It is cool, clear, and tasteless.

Springs and wells may not always remain safe, however, unless properly protected. In the first place, a spring or well should be located in such a way that dirt from the toilet or stables will not run into it. A well should be properly built, so that it is protected from all kinds of surface drainage. The top should be surrounded with a layer of cement or concrete which extends into the ground for a short distance. The covering on top of the well should be tight. Wells which are not properly built are open to pollution, and frequently such wells are the means of spreading disease. Springs need to be protected, too, if their purity is to be maintained. A

spring may be covered with a boxlike structure which has a pipe through which the water may run.

Water from springs or wells ought not to be too hard. In soaking through the ground, water sometimes picks up mineral substances which change it from soft water which fell upon the ground as rain to a very hard water, with which one must use a large amount of soap in washing. What experience have you had with hard and soft water?

Sometimes a farmer brings water from a spring on a hill directly into his house. He is careful to use a galvanized iron pipe to keep the water pure, for long lead pipes would poison the water.

Qualities of good water. — The questions which the pioneer or the farmer asks in regard to good water are the same ones that you need to consider if you are securing a water supply for a camp in which you expect to spend the summer. Indeed, they are essentially the same questions that a city must ask in selecting its water supply:

1. Is the water free from color?
2. Is the water clear — that is, free from suspended matter like sand or clay?
3. Is the water free from odor?
4. Is the water free from iron?
5. Is the water cool?
6. Is the water soft enough?
7. Is the water free from lead or other poisons?
8. Is the water free from waste material which may contain germs of communicable diseases?

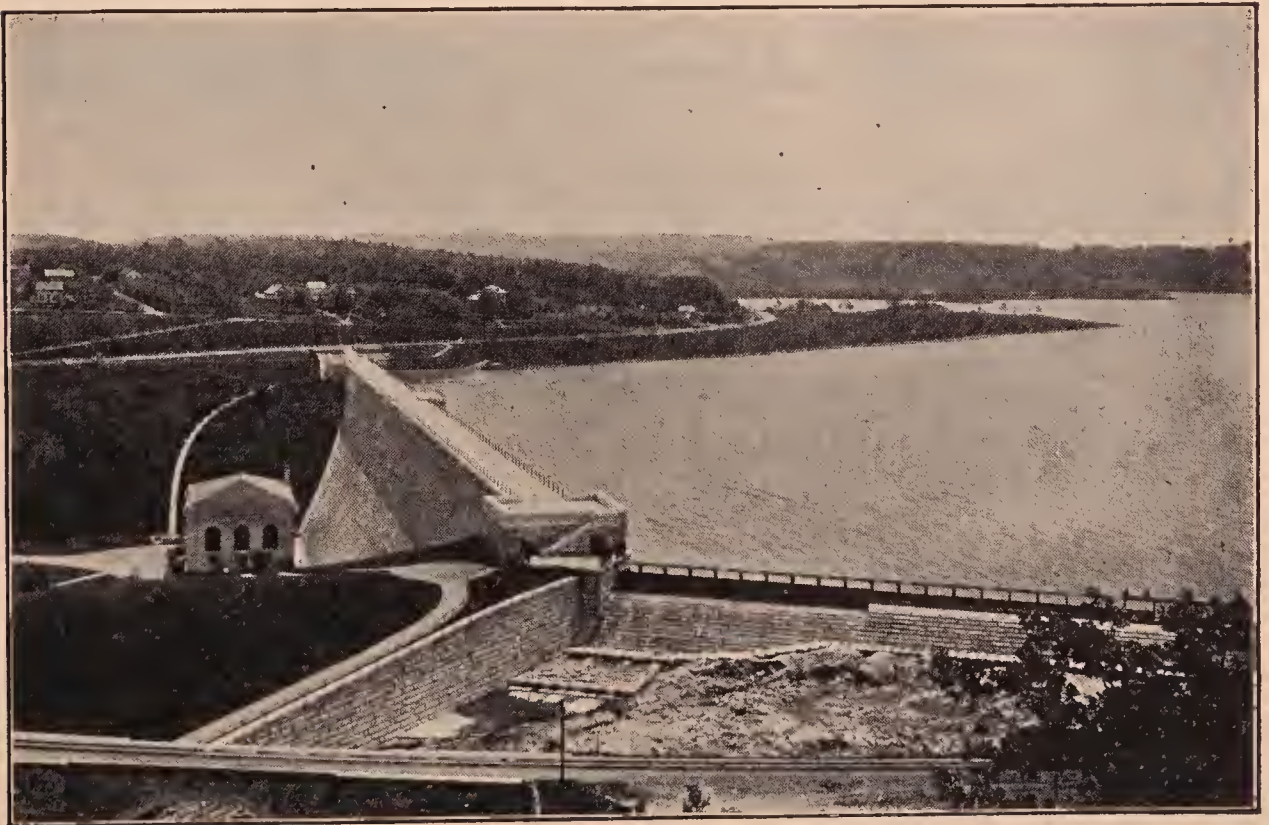
City water supplies. — It is not easy to get a satisfactory water supply for a big city because the city needs not only the right kind of water but also a tremendously large amount of it. Sanitary engineers who plan city water supplies provide water for American cities on the basis of a hundred gallons a day for every person in the city. We do not actually require one hundred gallons each for personal use, of course. Large amounts are used about the house, in factories, in putting out fires, and in sprinkling streets or cleaning them. How much water is needed per day for your city?

The city, like the pioneer, must choose between a surface water supply from rivers, streams, or lakes, and a ground water supply from large, deep wells. Occasionally a city may be fortunate enough to have an ideal water supply near at hand. Back in the hills somewhere, there may be lakes of clear water which are fed by springs and by drainage from hillsides where no one lives. The water falls as rain upon the hillsides and soaks into the ground, making its way through sand or gravel down to the lakes. In moving through the ground the water leaves all of its dirt behind and comes to the lakes clear and cold. From these natural reservoirs it flows downhill to the city, where it is distributed to houses and factories.

As a city grows and the country about it becomes more thickly settled, there is greater difficulty in securing a safe and sufficient water supply. New York brings part of its water supply from the Catskill Mountains,

a distance of many miles. In many places the only water available is soiled with the wastes from houses and factories. There are various ways of purifying water supplies.

Water purification. — The most dangerous substances likely to be in a water supply are those which come from the wastes of the human body, because they contain bacteria from the intestinal tract. Water which has been soiled by the entrance of body wastes is said to be *polluted*. It is easy to see that such water must be purified before it can be used as a drinking-water supply. If typhoid fever germs get into water, from the body wastes of a person who has typhoid, they may live in



WATER MAY BE PURIFIED BY STORAGE IN A RESERVOIR
(Reproduced from *State Sanitation*, by G. C. Whipple, by courtesy of the
Harvard University Press)

the water long enough to pass through the pipes into the houses of the city and thus endanger the lives of people who drink the water. Water which contains disease germs is said to be *infected*. The water in a city supply may be a little warm, or colored, or muddy, and yet not be actually dangerous, but it must always be free from disease-producing bacteria.

One of the ways in which water may be purified is by *storage*. When water stands for many weeks in a lake or a large reservoir the dirt and harmful bacteria settle to the bottom. Thus the water purifies itself by dropping its dirt or pollution.

Another means of purification which is used by many cities is the process of *slow sand filtration*. The water runs through filters of fine sand. These strain out the dirt and bacteria, producing a supply of water which is clean, sanitary, and entirely satisfactory.

This filtering process is extremely interesting. If we were going to filter water for a city, we should have to build boxlike filters perhaps an acre in area. We should make concrete floors and tight concrete or brick walls at the sides. Along the floors we should have drain pipes with many openings. A layer of big rocks would be placed above the drain pipes to prevent the sand from plugging the small openings. Then smaller rocks would be added, then gravel, and finally sand, on top. Then we should run water in at the top and let it filter through the sand; the purified water would be carried away through the drain pipes at the bottom.

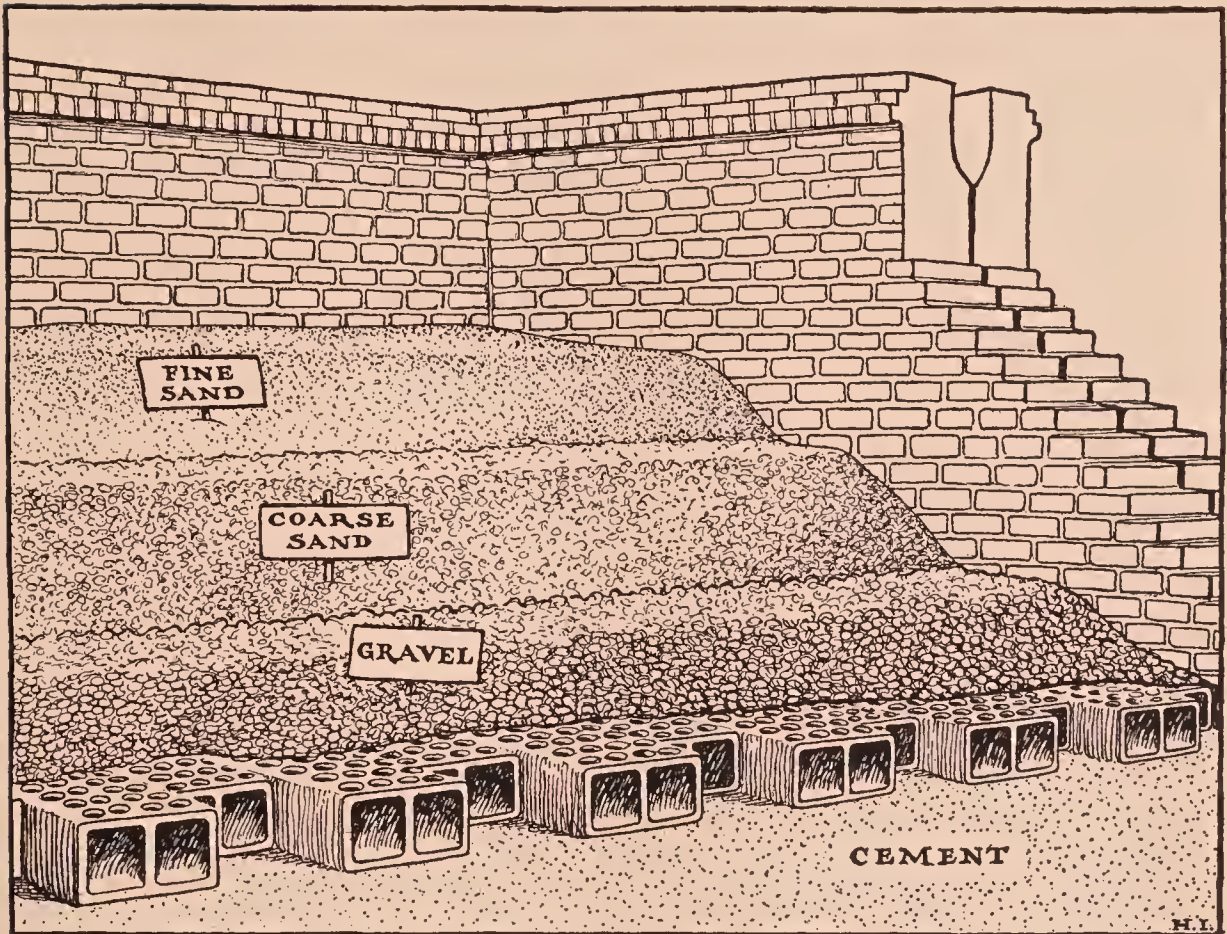


DIAGRAM SHOWING HOW A SLOW SAND FILTER IS BUILT

The dirt in the water is held back by the sand. The bacteria are smaller, however, and could get through between the grains of sand as easily as you could go between two houses, were it not for the fact that another process goes on here. All the sand at the top of the filter becomes covered with useful, harmless bacteria which stick there, because they produce a kind of jelly as they grow. The sand grains fit together fairly closely, of course, and you can imagine what the top of the filter is like when these grains are each enlarged by a layer of bacterial jelly. If we should wash some of the sand in water, and examine this water under a microscope, we

could see some of the bacteria which are living on the sand grains producing the jelly covering.

The jellylike substance helps to fill up the holes between the sand grains. Its stickiness is an advantage, too; for dirt and bacteria in the water stick to the jelly more easily than to clean sand. If there are harmful bacteria in the water, they are caught and held at the top of the filter.

There is one other kind of filter which is commonly used, the *mechanical filter*. It makes use of a chemical process which partly purifies the water before it is filtered. Do you know what is meant by mixing two liquids together so that a precipitate is formed? Have you ever seen a mixture of liquids where flakes are formed in the mixture? Two liquids, made by dissolving lime and alum, are added to the water. These unite to form little flakes which settle down to the bottom, carrying the dirt and bacteria with them, just as snowflakes clean the air in a snowstorm. The clean water is then passed through a small sand filter.

In this mechanical sand filter no bacteria grow on the top of the sand. The dirt and bacteria are caught by the flakes of the chemical, and these flakes are caught and held back by the sand. When the flakes of chemical begin to clog the filter, the sand has to be washed by water which is forced up through it from below.

Another way of purifying water is by the use of *chlorine*. You have heard of the use of poisonous gases in warfare. One such gas is chlorine. Chlorine gas is

poisonous to all living things. Does it seem dangerous to add such a substance to a drinking-water supply? It is not dangerous, because it is used in such small quantities. Not enough is added to be injurious to man, but enough is put in to kill bacteria.

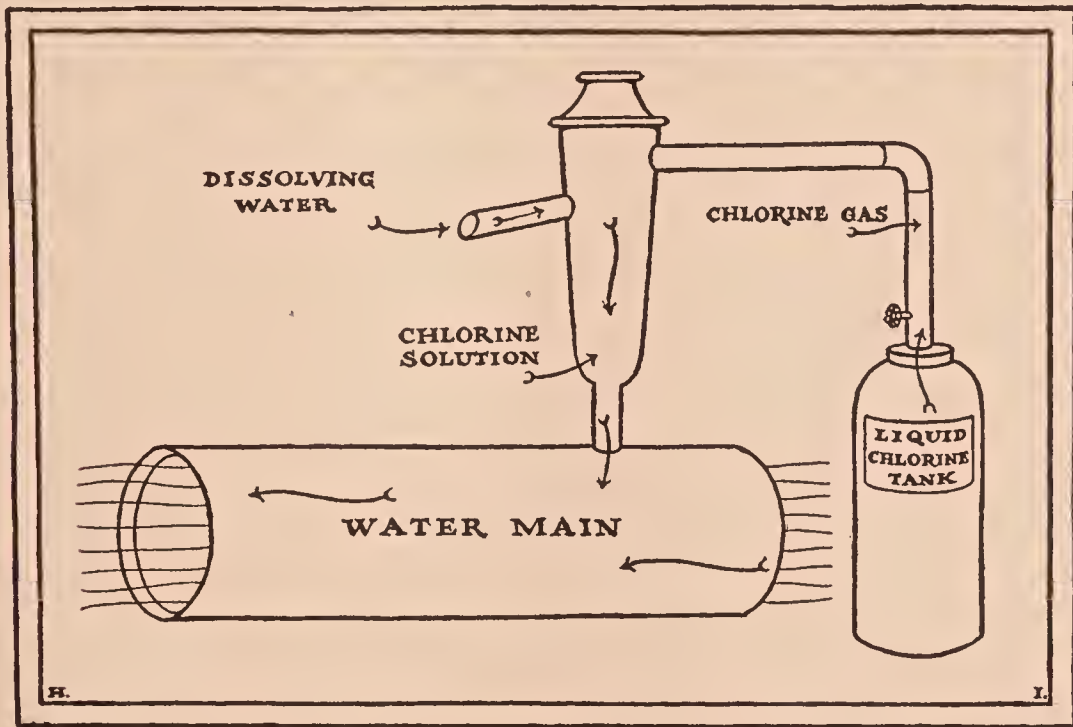
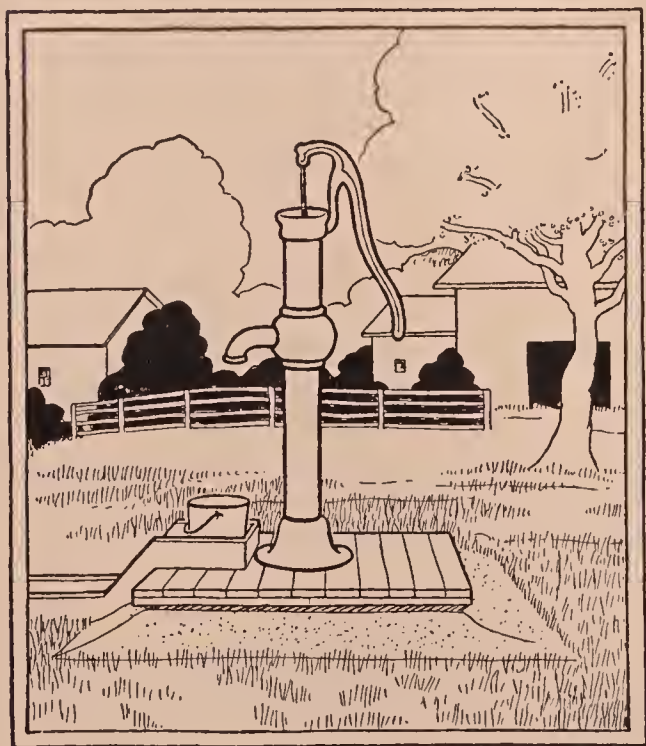


DIAGRAM SHOWING HOW CHLORINE IS PUT INTO
A WATER SUPPLY

Chlorine is usually bought in tubes which look much like the large tubes you have seen at soda fountains. These are attached to a small pipe through which water is running, and the gas is allowed to mix with the water and be dissolved. This small amount of water containing the dissolved chlorine gas then flows into the large water main, where it mixes with the whole supply, reducing the amount of chlorine to the point where it does not produce a disagreeable taste or odor, but still is present in quantity sufficient to kill the bacteria.

Keeping watch over the water supply. — Continual watch is kept over a city water supply by tests made in the Health Department to make sure that the water remains pure. In the past, epidemics of typhoid fever have been caused by infected water supplies. The story of such an epidemic at Plymouth, Pennsylvania, is told in the chapter on Waste Disposal. City water supplies are now so carefully controlled that there is less typhoid fever in cities than in the country. It is easy to keep watch over the city water supply and see that no impurity gets into it, but in the country every family has its own water supply, and these small separate supplies cannot be controlled easily by the Health Department.

Of course, it is just as important for families in the



A WELL WHICH IS PROPERLY
PROTECTED

country to have pure water as for those in the city. The primary problem here is to secure pure water in the first place. If one is obliged to use, for a time, water which is suspicious, there are simple ways of purification in the home.

Well water or spring water is safe only *if protected* so that no pollution from body wastes can enter it. Could you

answer the following questions satisfactorily in regard to the water supply which you use in camp or in your country home? (1) Is the well or spring located in a place where there is no possibility of drainage from a toilet or stable? (2) Is it completely covered at the top and protected thoroughly, so that no pollution from people or animals can enter from the surface?

(3) In case of any possible doubt, have you consulted the Health Department of your town, your county, or your state?

Sometimes during camping or traveling one is obliged to use water which is suspicious. Remember that boiling water makes it safe, because the harmful bacteria cannot live through this process. It is worth while to take a little trouble to purify water if you do not feel certain that it is pure.

Ice. — Ice should be as pure and safe as water because the practice of putting ice into cold drinks is extremely common. Much of the ice used in cities nowadays is made in electric refrigerators or in factories, being frozen

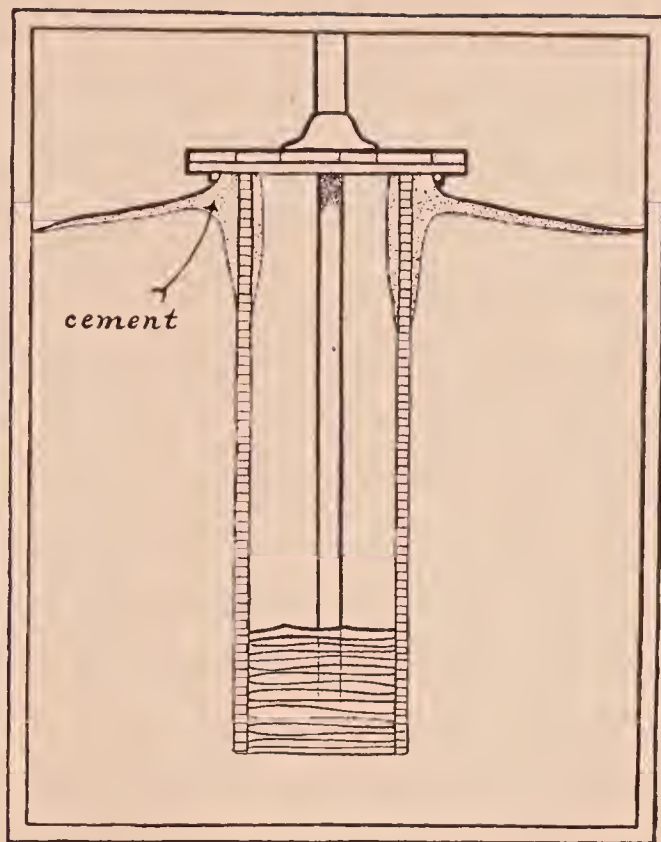


DIAGRAM SHOWING HOW THE
WELL IS PROTECTED

from the pure water of the city supply. Natural ice is usually pure unless there has been pollution on top of the ice after it begins to freeze.

Professor Sedgwick tells in a delightful way the story of ice formation:*

“ There appears to be good ground for the popular belief that natural ice considerably purifies itself in freezing. The ideal and most favorable condition is that offered by a lake of pure, quiet, and deep water in a region remote from human habitation. In such a case, on a still, cold night, the surface of the lake, chilled by the freezing air, hardens into a thin and delicate mirror composed at first of shooting, interlacing crystals. Each of these, as it forms on the very surface of a mother-liquor which is itself almost wholly pure, readily pushes aside most foreign substances such as bacteria, though between the shafts of neighboring crystals or on their surfaces a few may be caught and confined. A little later, the first horizontal skimming of ice having been formed by the interlocking or other union of crystals, fresh crystals send shafts downward into the now more quiet water just beneath them, and, the cold continuing, join themselves firmly to the layer already formed. But now quiet reigns below the ice, and gravity incessantly drags downward through the water everything within its reach. The purest layer of water, therefore, is now the highest, and into this fresh crops of crystals are

* SEDGWICK, WILLIAM THOMPSON: *Principles of Sanitary Science and the Public Health*.

steadily growing from above. Thus it happens that the uppermost layer of the ice is least pure, for this includes more of the dust of the air, more floating matters, and is formed without any overlying sheltering solid layer, such as, after its formation, stills the water and shields the under layers. This ideal condition, however, is rarely found. An impure pond or river is too often the source of supply. A sudden freeze often follows a thaw which has made turbid and dirty the waters from which the ice is then derived; or a snow falling during a dry and windy period collects from the air a vast amount of dirt and falls upon pure ice, finally thawing and then freezing, only to weld itself as poor and porous 'snow ice' to the better, purer ice beneath it."

It should be fairly easy for you to draw your own conclusions now in regard to ice. If you know that the source of your supply is satisfactory, you may use the ice freely, without anxiety as to pollution. If there is a possibility of pollution in the ice, you can avoid actually putting the ice into your cold drinks and use it merely for chilling in the ice box.

Sanitary drinking cups and bubblers. — All the precaution to protect a water supply at its source may be offset by careless habits of drinking in home, school, and factory. Undoubtedly there are countless families in which common colds and more serious forms of illness are spread by use of common drinking glasses. In some parts of the country the common drinking cup is still used in public places, where it is a source of danger to

all who use it. Bubblers fountains are supposed to remedy this evil, but they are not effective unless they meet the



proper sanitary requirements. The stream of water should be thrown from the side so that it does not fall back over the opening of the bubbler. The latter should be arranged in such a way that no person can put his mouth on the opening.

Responsibility. — In the protection of a water supply, as in other problems of community health, there is the twofold responsibility — that of the government and that of the individual. The local government should ensure a safe water supply for the citizens of the town and city. Each citizen should refrain from any act which will pollute the water supply, and should avoid infection through common drinking cups or insanitary bubblers.

PROBLEMS AND PROJECTS

1. What qualities should the water of a public supply possess?
2. Make a drawing of the cross section of a sand filter.
3. Make a drawing of a well properly protected from pollution.
4. Make a drawing of a spring properly protected.
5. Make an investigation of your city water supply. Where does the water come from? How is it purified?

V

WHOLESOME FOOD

In what ways is food related to health?

What personal responsibilities do we have in securing proper food?

To what extent is diet related to the customs and living conditions of people?

Are communicable diseases ever spread through food?

What does our government do for us in securing a wholesome and safe food supply?

The vigor of a nation is largely determined by its diet. For the individual or for the community, food is one of the first health considerations. Every one who goes into training for athletics, or for general health and efficiency, finds that proper diet is a most important part of his training program. Since you first began to follow the rules of health, you have known the importance of suitable and regular meals. Every person who wishes to safeguard his health must exercise some care over the kind, the quantity, and the cleanliness of the food which he eats.

Food substances. — Your earlier study of health has taught you the kinds of food substances, which include: (1) *proteins*, for growth and repair (found in milk, eggs, meat, and fish); (2) *sugars, starches, and fats*, for energy or fuel to make the body go and to keep it warm;

(3) *minerals*, to aid growth and regulate the body processes; (4) *vitamins*, to regulate the body processes (important regulating and mineral foods are fruits, vegetables, dark breads, whole-grain cereals, milk, and eggs); and (5) *water*, to regulate body processes.

A knowledge of the scientific facts about foods shows that it is extremely important to eat a variety of the foods which nature intended us to have. Indeed, there is grave danger in limiting one's food to a few items only, unless those items of food are chosen with special care. Food is so important in maintaining health that doctors now use diet in treating many kinds of sickness. The market is the place where nature's products are sold, and surely it is not too much to say that some of the best medicines of the human body can be bought there instead of in the drug store.

Just as there are some especially beneficial substances in food, there are also some injurious ones. Certain mushrooms and certain inedible species of fish contain natural poisons. A few people are sensitive to substances in some of the most wholesome foods, such as strawberries, eggs, tomatoes, milk, or oatmeal. These foods cause a rash on their skin. The trouble here is not a defect in the food but in the person. It is often possible for children to overcome this difficulty by eating small amounts and gradually increasing the portion.

Changing food habits. — Have you ever thought of the changes in food habits which accompany changes in the manner of living? *Home Life in Colonial Days*,

written by Alice Morse Earle in 1898, describes the customs and habits of people in colonial times. Their food habits furnish quite a contrast to our own. In the early days of our country the entire food of a household could be produced on the farm. In a paper published in *The American Museum* for 1787, a farmer says: "At this time my farm gave me and my family a good living on the produce of it, and left me one year with another hundred and fifty dollars, for I never spent more than ten dollars a year, which was for salt, nails, and the like. Nothing to eat, drink, or wear was bought, as my farm provided all."

What a contrast to the modern conditions of living! What percentage of the things to "eat, drink, or wear" was bought by your family last year? It is difficult for our imaginations to picture the lives of the people who lived in the thirteen original colonies. We find in books like the one mentioned above such interesting facts as those reproduced in the next few paragraphs.

In Georgia the Indians sold a deer for sixpence, and thirty-pound wild turkeys for fourpence each. Wild pigeons sold in Boston for a penny a dozen. The seas, rivers, and lakes teemed with fish. There were many families that found their supply of sweets in maple sugar and wild honey. Milk cost a penny a quart.

In 1728 there was a discussion in the Boston newspapers as to the expense of keeping a family "of middling figure." The writers all named only bread and milk for breakfast and supper. Bread was made of



HOME LIFE IN COLONIAL DAYS

“rye-an’-injun,” which meant half rye meal and half corn meal. Pumpkins and squashes were native dishes. Indian corn, a native of American soil, not only saved some of the colonists from starvation but became one of the most important foods.

The Virginia Indians boiled beans, peas, corn, and pumpkins together, and the colonists liked the dish. Potatoes were known to New Englanders, but they were not commonly used. Beans were abundant and

were baked by the Indians in earthen pots, just as we bake them today. The settlers planted peas, parsnips, turnips, and carrots, which grew and thrived. Huckleberries, blackberries, strawberries, and grapes grew wild. Apple trees were planted and grew well. Peas were plentiful and good in all the northern colonies.

Pickles, sliced fruit, preserves, candied fruit, and marmalades were dainties which were made in most homes. In all households, even in those of great wealth and many servants, assistance was given in all housewifery by the daughters of the household.

Salted meat was eaten, but very little fresh meat was used, for there was no means of keeping it. Perhaps the busiest month of the year was November, or "killing time," as it was called. When the chosen day arrived, the oxen, cows, and swine which had been fattened for the winter's stock were slaughtered early in the morning, so that the meat might be hard and cold before being put in the pickle. Sausages and headcheese were made; lard was tried out and tallow saved.

How strange it would seem to have fresh meat only occasionally! Apples and cabbage must have been very important foods in winter. Think of having "rye-an'-injun" bread, no sugar, and little or no molasses! The diet of our forefathers was different from ours, but was it less healthful? What do you think?

The farmer who wrote in *The American Museum* in 1787 certainly had one advantage so far as his food was concerned. He knew that it was clean because it was

all raised and prepared on his own farm. He was sure that only healthy animals were killed, that all vegetables were grown in unpolluted soil, and that the food was clean when he got it. He did not have to rely upon other people to prepare it for him. Today, living as we do in cities, we must depend mostly upon other people. How many boys and girls in your class raise their own vegetables, fruits, pork, beef, or chicken?

Few of us raise our own food supply; we even buy a great deal of our food already cooked. This is not necessarily a disadvantage. In fact, the earth could hardly support the number of people living upon it today if every family raised all it needed to "eat, drink, or wear." We expect to buy most of our food, but we want to be sure that the food is clean, wholesome, and properly prepared. We cannot look up for ourselves the source of each article in our diet, but our government guarantees and safeguards the quality of the most important foods.

Food adulteration. — One of the things which our government does is to prevent the adulteration of food. There are various ways in which food may be adulterated. Sometimes a valuable part of the food is removed, as when cream is taken from the top of milk and the skimmed milk is sold for whole milk. Sometimes a poorer substance is sold in place of a better one, as when cottonseed oil is sold for olive oil. Frequently some foreign substance has been added to a food. For example, cocoa and chocolate have been adulterated by the addition of starch or sugar; water has been added to

milk; and ordinary sugar dissolved in water has been added to maple syrup. Cheap candy is sometimes made of materials which are not the best. Frequently, as you see, the adulterated food is not injurious to health, but the customer is cheated because the food he buys is not what it is represented to be. Sometimes people sell food which has spoiled and which endangers health.

It was found long ago that a large percentage of the food sold in the United States was adulterated. This knowledge led to the passage of the Food and Drug Act in 1906. This act defines the different kinds of adulteration and demands that the label on the package shall tell the truth concerning the product within. It also prohibits the shipping of adulterated foods from one state to another. This law does not prevent the manufacture and sale of adulterated food within any particular state, and each state, therefore, has its own food adulteration law.

The Food and Drug Act also prevents the dishonest labeling of drugs and patent medicines which are sold in packages. The exact amount of alcohol and other harmful substances must be stated on the label. The label cannot carry untruthful statements concerning the cures which the medicine will effect. One should remember, however, that this law applies only to the truthfulness of the label on the package; it does not apply to the advertising which is done in newspapers and magazines. You may be interested to discuss in class some of these advertisements which claim impossible cures. We

must always use our common sense and not put too much faith in advertising statements of this kind. People are further protected from the "habit-forming" drugs by the Harrison Narcotic Law, which definitely restricts the sale of such substances.

Meat inspection. — Another service of our government in securing clean and wholesome foods is the inspection of meat. It is important that meat should come from animals which were free from disease. Inspectors examine the sanitary conditions of the buildings in which animals are killed; they examine the animals before slaughter; they examine the meat after slaughter; and they watch the processes of preparing meat products for shipment. Meat from diseased animals, or meat products which are unhealthful because of the insanitary conditions in which they are prepared, are condemned and destroyed.

Certain meats may also be injurious, unless they are thoroughly cooked, because they contain parasites. A parasite is a plant or animal which lives upon some other plant or animal, called the host, and gets its food from the host. Parasites are interesting because they have such a strange existence.

You have no doubt heard of the tapeworm, which lives in the intestine of man. It absorbs for its own use the food which the body needs, and thereby lowers the general health. A common form is the beef tapeworm, which gets into the intestine when man eats beef containing the worm in its immature stage. The eggs of

the tapeworm are then expelled in the body waste, and may reach cattle through their food or drinking water. The eggs develop inside the cattle, and the worm in its larval stage works its way into the muscles of the animal. Unless these parasites are killed by thorough cooking before the meat is eaten, they develop into the adult tapeworm in the intestine of man.

This train of events by which new generations of the animal are produced is called the "life cycle" or "life history" of the parasite. There are also a pork tapeworm and a fish tapeworm. If the presence of these parasites is discovered when the meat is inspected, the meat will be condemned, but a further safeguard is to have meat thoroughly cooked.

Another parasite which is sometimes found in pork is a round worm called *Trichinella*. These parasites are in the muscle of the infected animal, and when the meat is eaten without thorough cooking, the parasite develops in the human intestine. There the worms produce their young, which get into the blood stream and make their way through the body of man into his muscles. This process is accompanied by illness with high fever and much pain in the muscles. The Bureau of Animal Industry has found that this parasite cannot *always* be detected in the examination of hogs, and it has issued a warning that pork should always be cooked until every part of the meat has turned white. Cooking is a great sanitary safeguard, and there is no danger from animal parasites when food is thoroughly cooked.

Most animals are healthy, but meat inspection is well worth while in preventing the use of meat from an occasional diseased animal. The Federal Government spends about five million dollars a year in inspecting the meat which is shipped in interstate commerce. About one-third of the meat used in this country is raised in the same state in which it is consumed. Federal food inspectors do not inspect such meat supplies, and it is therefore important that states and cities should provide their own meat inspection service for local products.

Food Sanitation. — Most bacteria, as you have already learned, are harmless. Some are even helpful. The flavor of butter and of certain kinds of cheese is due to the presence of special kinds of bacteria. Vinegar is made by the action of acetic-acid bacteria growing in apple juice. Buttermilk and various sour-milk drinks are the products of lactic-acid bacteria.

On the other hand, the most important health problem arising from the fact that we cannot produce our own food is that which is due to the existence of the harmful bacteria. Of course the great sanitary safeguard of cooking can be relied upon to kill bacteria, but there are some foods which we eat without cooking. It is also possible under some conditions that foods may be infected with harmful bacteria after they are cooked. You have already studied the care of food in the home. Let us now consider the sanitation of food from the standpoint of the community.

Milk. — It is not surprising that the sanitation of the

milk supply should receive first consideration, for milk has always been the most important single food of most nations. The history of milk production is a fascinating story. We are told that, thousands of years ago, on the plains of Central Asia, the ancestors of all the "white races" of the present time were herders of cattle. So important were the cows to the people of that ancient day that the king or warrior chief received the title of "Gopatis," meaning "Lord of the Cows." The possession of cattle meant happiness and prosperity; he who was king of the people must be able to provide for the protection and well-being of the herd. No subject of the Gopatis could kill a cow even for food, for the people knew that the cow's milk was of greater importance than meat. The records of these people say that "the killer of a cow must stay a month in penitence, sleeping in a stable, following the cows, and he must purify himself by the gift of another cow."

If we had time we could trace through the history of many nations the story of the dairy industry. When the Hebrews came into their ideal Promised Land, they described it, not as a land rich in gold or jewels, but as a "land flowing with milk and honey." You may know that goat's milk as well as cow's milk has always been used.

Cattle did not exist in America before the white people came from Europe. When the Pilgrims first set foot on Plymouth Rock they brought no cows with them. Later, cows and goats were brought from

Holland — enough to supply one cow and two goats to every six people.

The pioneers profited from the experience of these early settlers. When they took their families and possessions into the Middle West they carried their cows with them. Today the great dairy industry reaches from the Atlantic to the Pacific, producing millions of quarts of milk each day by such careful methods that milk is brought to you clean and safe. Let us see what things are to be considered in the care of the milk supply nowadays, when cities are so large that some of the milk must be brought three or four hundred miles.

In your study of the care of foods last year you learned how easily milk spoils. Bacteria grow rapidly in it unless it is kept cold, and there are always some bacteria present. The most common ones are the lactic-acid bacteria, which feed upon milk sugar and sour the milk. If the bacteria which feed upon the protein are more numerous, the milk putrefies; it becomes bitter and unfit for use. If disease germs get into the milk from a tuberculous cow, or from a milk handler who has tuberculosis, typhoid fever, diphtheria, scarlet fever, or septic sore throat, the milk is really dangerous to use until it has been cooked or heated in the process of pasteurization.

The work of the government in controlling the milk supply begins at the dairy. It is of first importance to see that the cows are free from the form of tuberculosis to which they are subject. This is called *bovine* tuber-

culosis (from the Latin *bos*, meaning “cow”). The germ of the disease is slightly different from that of human tuberculosis, but the bacillus of bovine tuberculosis can cause the disease in man. A simple test (the tuberculin test) is used on the cows once a year or oftener to find out whether they have the disease.

There are definite sanitary regulations which govern the dairies. Every well-regulated dairy maintains these sanitary conditions. The barns are well constructed and have smooth floors. They are kept clean and free from dust and odors. There are plenty of windows, so that the barn is flooded with sunshine and fresh air. The buildings are located on high land, so that they are well drained. The manure is removed every day and is disposed of in a way to prevent the breeding of flies.

There is a special room or house for taking care of the milk. It is spotlessly clean and screened to keep out flies. There is hot water for cleaning the utensils and steam for sterilizing them. If the dairy is not supplied with steam the utensils should be thoroughly scalded after washing. When not in use they are kept free from dust or other dirt.

The milker is a man of good health, free from any disease with which he might infect the milk. He wears a clean white suit for milking, and washes his hands with soap and warm water before milking each cow. He uses a pail with the top partly covered, in order to keep out the dust. His cows are kept clean, with their hind quarters and tails closely clipped. Their udders are washed



MILKING IN A HIGH-CLASS DAIRY

before milking. These last-mentioned precautions are well executed only in the best dairies.

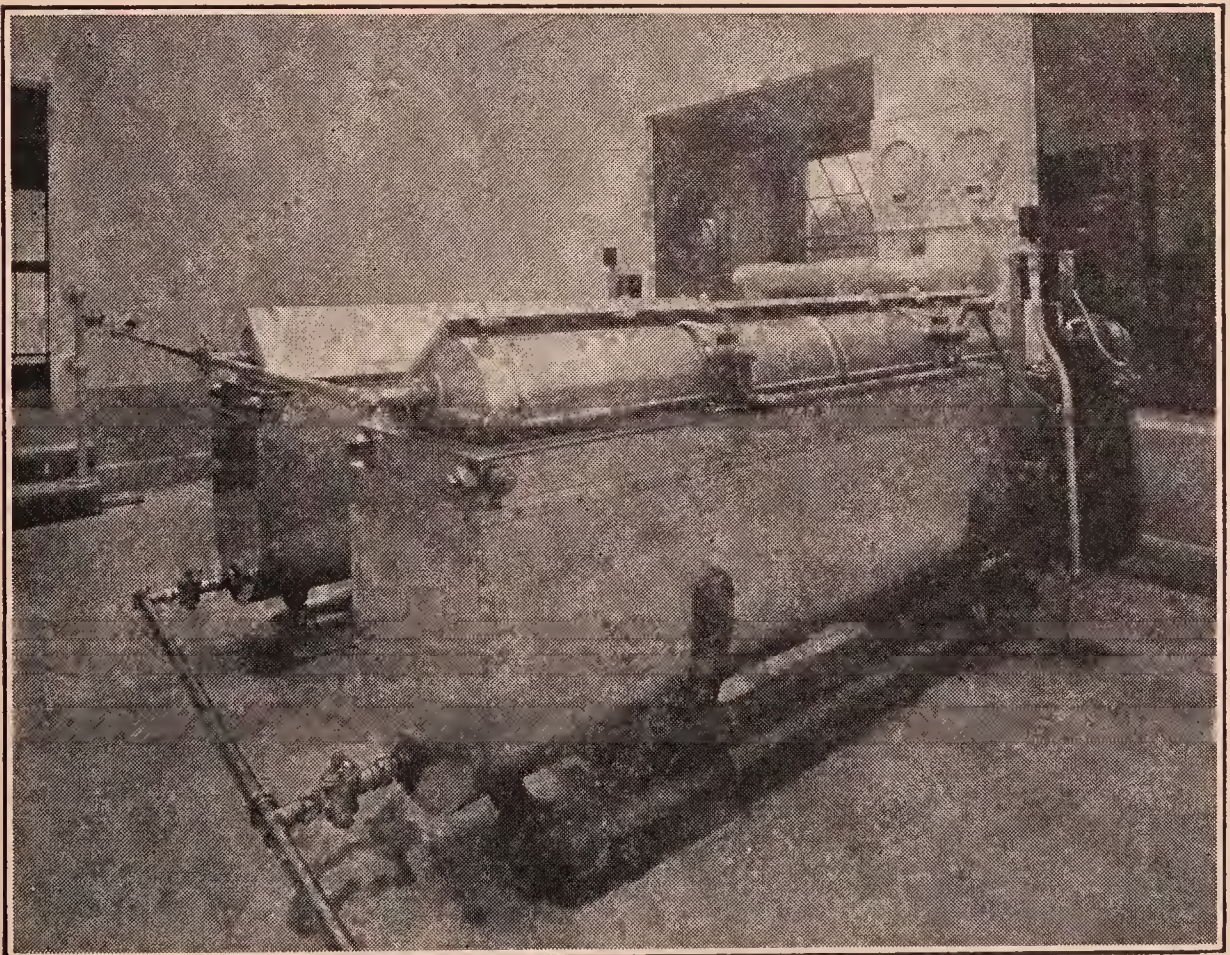
After the milking the milk is immediately cooled so that bacteria cannot grow rapidly, and it is kept under refrigeration constantly until it reaches the place where it is to be used.

Even with the inspection of dairies, cities very wisely insist upon the pasteurization of milk. This means heating to a temperature of from 140° to 145° F. for twenty to thirty minutes, or to a higher temperature for a shorter period. Pasteurization improves the keeping quality of the milk and kills any harmful bacteria which are in it.

Only milk of the highest quality is safe without being

pasteurized. Such milk ("certified milk," "grade A raw milk," or "special babies' milk") is produced under the supervision of a group of physicians called the Medical Milk Commission. The cows, the milkers, and the milk handlers are examined every day to be sure that they are perfectly well. The milk is drawn and handled so carefully that it contains very few bacteria, and it is delivered within twenty-four hours after it is milked.

It would be impossible to produce enough milk near the large cities to give us the amount we need. We are therefore obliged to secure a great deal of our milk supply from farms far removed. It is also difficult to



A PASTEURIZING MACHINE

have milk produced under ideal conditions. For these reasons pasteurization has come into general use.

The pasteurizing process makes it possible to furnish milk in large quantities to people in the city at a moderate price. The ideal method is to pasteurize the milk in the bottle. Sometimes, however, it is pasteurized in bulk and bottled later. If the bottling is done promptly and the methods are clean, this system is satisfactory.

In order to keep the milk supply safe and clean, the town or city government licenses the people who sell milk. Samples of the milk are taken regularly and analyzed in the Health Department laboratory. Regular inspections are made of dairies, milk wagons, and all places where milk is sold, to make sure that sanitary regulations are obeyed.

Other foods. — There are other foods besides milk which need sanitary control. We have already spoken of the control of the meat supply. Shellfish are sometimes eaten without being cooked, and therein lies a danger. If they are taken from water into which sewage flows, they may pick up the germs of typhoid fever from the polluted water and so transmit the disease. Cities and states have therefore found it necessary to make regulations in order to be sure that oysters are taken from unpolluted waters. Some vegetables are eaten raw; even though they are thoroughly washed in the home it is important to be sure that they were not grown on land which was polluted with human body waste, and that they were kept clean in the market.

Food poisoning. — Doubtless you have heard of instances of food poisoning (the term “*ptomaine* poisoning” should not be used) where several people have suffered ill effects from eating some particular food. These food poisonings are of two types. One kind of food poisoning is called botulism, and is caused by a bacillus which sometimes gets into food that is not kept clean. This sort of poisoning has been known to occur from sausage, pork, and vegetables. The bacillus of botulism grows upon the food before it is eaten and produces a poison.

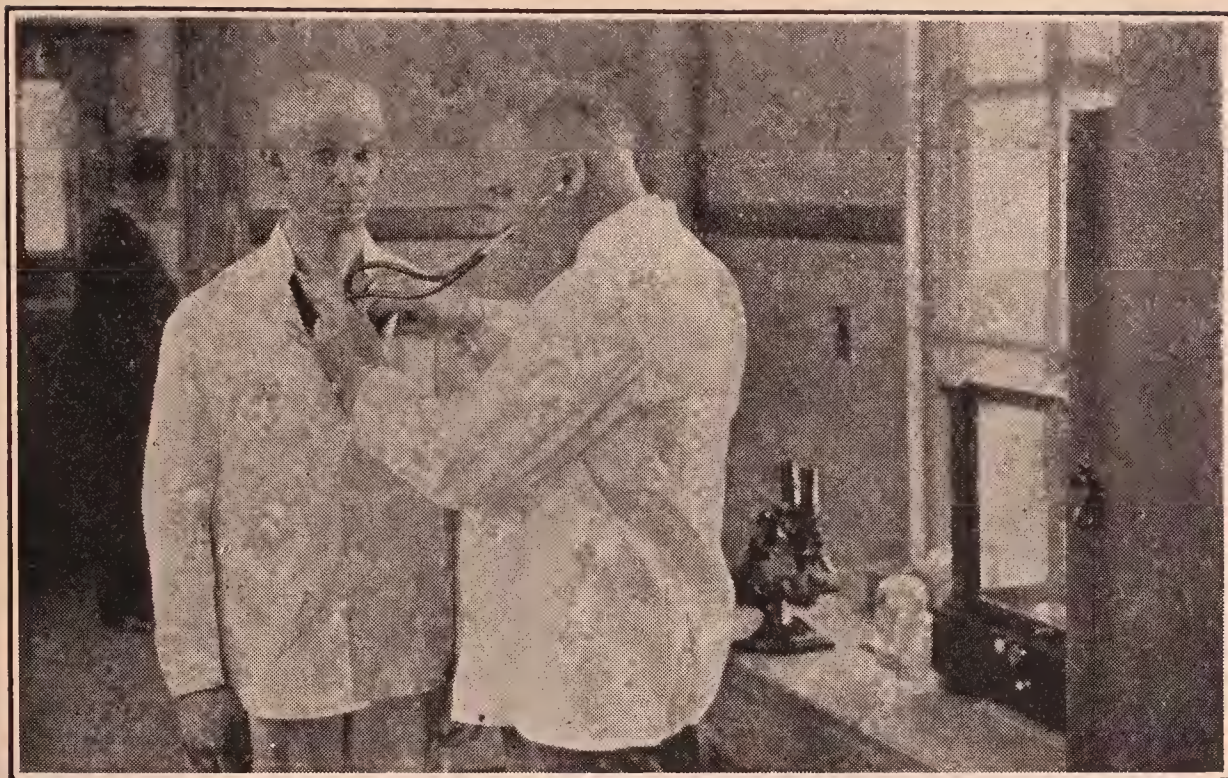
The other kind of food poisoning, which is still sometimes miscalled “*ptomaine*” poisoning, is really an infection of the person with some bacillus which has reached the food (meat, milk products, or vegetables) because it was not kept under sanitary conditions. These bacteria grow in the human intestine and cause an irritation. We see, then, that food poisoning arises from failure to keep food scientifically clean.

Food control. — If food is handled by any person who has a communicable disease, it is possible, of course, for the person to transfer disease germs to the food. In this way the disease may be transferred to another person. Common cold is undoubtedly spread in this way, not only in restaurants, but in the home from one member of a family to another. You think perhaps that this process of transferring disease germs through food cannot be very dangerous because most sick people are in bed and not handling food for others. People do

not go to bed with common colds, although it would be better if they did. Sometimes a person has a disease in such a mild form that it is not recognized, and after he appears to be entirely well he still carries the germs in his body for a while. A person who carries the germs of a communicable disease without being sick himself is called a *disease carrier*. The diseases with which foods are most likely to become infected are common cold, typhoid fever, tuberculosis, and dysentery.

What has been said about food poisoning and the transfer of disease by people who handle food shows clearly what the community government needs to do in order to protect the people. It is necessary to supervise markets, bakeries, food shops, and restaurants to see that the places are sanitary, that the food is properly handled, and that it is not exposed to flies or dirt. People who handle food in bakeries and eating places should be examined regularly by a doctor to make sure that they are in good health and will not transmit any disease through the food.

It is impossible to list here all the details of food-shop sanitation. One important point is to have the whole place well screened so that the shop is free from flies. It is necessary that food handlers should wash their hands frequently. For this reason every food shop should provide convenient and sanitary facilities for hand-washing. Another item of importance is to have the food covered, and not displayed on top of show cases where customers stand over it or handle it.



THE DOCTOR EXAMINES A FOOD HANDLER

Ice cream production is supervised, too, because bacteria can live in ice cream, and it has been known to be the means of transferring disease. It must be made of pure milk or cream and produced under sanitary conditions.

Cold storage and refrigeration of food also receive government supervision. The use of refrigeration makes it possible to transport foods from one part of the country to another without spoiling. Cold storage makes it possible to preserve foods for a long time. The government protects us by requiring that foods shall be stored under sanitary conditions and at proper temperatures. They are sold as cold storage goods.

You have learned in this chapter some of the things which are done by the city government, and probably

you appreciate more than ever before the importance of having a good Health Department. Do not think, however, that these dangers which are pointed out are common. Food dangers are relatively rare, and those which do exist are usually found by the Health Department, so that we are carefully protected. The fact that there are a few patches of poison ivy in the field or in the woods does not worry the farmer. Knowing what they are and where they are, he takes care not to get into the ivy and get poisoned. Likewise, our government knows what are the dangers in the food supply and protects us from them.

PROBLEMS AND PROJECTS

1. What are the different kinds of food substances?
2. What do they do for the body?
3. Why is it important to get the right amount of food?
4. Contrast our present diet with the diet of the early colonists.
5. Contrast the methods of securing food today with those of the early colonists.
6. What are the different kinds of food adulteration?
7. What should be done to keep cooked food clean in stores?
At home?
8. Look in the stores where you buy vegetables, fruit, or cooked food and find out what care is taken to keep the food clean.
9. Give reasons for the importance of milk as a food.
10. Give rules for keeping milk after it is delivered.
11. Visit a dairy and write a report on the sanitary conditions.
12. Lantern slides and strips of film are available on the subjects of clean milk and food control. Write to your State Department of Health for information.

VI

ALCOHOL, TOBACCO, AND OTHER HARMFUL SUBSTANCES

What is a narcotic?

Does the use of tobacco actually affect athletic ability?

Does it affect scholarship?

Why is a locomotive engineer forbidden to use alcohol?

What are the effects of alcohol upon the body?

Why is the use of alcohol a community problem?

The problem. — One part of the alcohol, tobacco, and drug problem is the relation of these substances to personal health and efficiency. People who are enthusiastic in their support of personal freedom feel that one should have a right to smoke or drink, no matter how much it may injure him. Many feel, however, that their lives are so closely tied up with the lives of others that they can scarcely assert “personal rights” in this selfish fashion. We are valuable members of a social group, or effective citizens in a community, only when our lives are regulated in a way which is reasonable and which enables us to maintain health and efficiency. If we, through self-indulgence, reduce our health and efficiency to the point where we do not contribute anything to other people through our thought or our work, we are of little importance so far as the community

is concerned. If we go a step farther, reducing our health and efficiency to the point where we become objects of care to other people, we are actually a burden to the community. Do you not think that society, as well as the individual, has rights and that we should consider the rights of others as well as our own?

Another part of the problem is that which arises from the social difficulties which accompany the excessive use of alcohol and drugs. A man who drinks habitually and heavily frequently fails to provide a living for his family. He cannot hold a job because he is not reliable, and what money he does earn is drawn upon heavily for liquor. Who can say how far-reaching are the effects of such a situation upon the lives of children? Who supports such families?

Still another phase of the problem is the danger to human life which comes about through the excessive use of alcohol and drugs. What do you know of the relation of drinking to automobile accidents? Have you ever heard or read of a fatal accident caused by an automobile driver or some other person who was drunk?

This chapter deals with the use of alcohol, tobacco, and drugs chiefly from the standpoint of their relation to health and efficiency and their cost to the community. The social effects of the excessive use of alcohol and drugs are extremely important, however, and they should not be lost sight of when we are considering the undesirable results of the use of alcoholic liquors.

TOBACCO

Probably most of you know that tobacco is a plant. In the same family with it are the potato, the tomato, and the poisonous henbane and deadly nightshade. The harmful substance in tobacco is nicotine, which is a narcotic. Narcotics, in effect, "put part of the brain to sleep." When they are powerful enough and used in large enough doses, they produce unconsciousness. The effect of nicotine in small quantities is less extreme than the effect of many other narcotics, as, for example, alcohol and opium, but its effect is distinctly poisonous.

Effects of smoking. — There is a common belief that smoking interferes with athletic ability. A very interesting study of smokers and nonsmokers has been made by Professor J. Rosslyn Earp.*

In ordinary college athletics it is difficult to learn anything about the effects of smoking. In intercollegiate sports so much emphasis is placed upon *winning* that the men are all put in training for some time before the event, so that even those who ordinarily would smoke do not use tobacco at all for some time before they compete. At Antioch College a different situation is found. There the sports are looked upon only as recreation, so that training rules are not enforced.

Professor Earp made a study of two track meets, one held in 1924 and the other in 1925. The first meet was competition within the college, and the second was a

* EARP, J. R.: *The Student Who Smokes*. Antioch Press, 1926.

friendly competition with another local college. Professor Earp believes that there was enough interest in the meets to attract the best athletes in college, although probably none of them were enthusiastic enough to change seriously their habits of living prior to the time of competition.

There were about as many smokers as nonsmokers in college. It would be fair to expect that the winners in these track events, then, would be about evenly divided between the group of men who smoked and those who did not, unless the use of tobacco actually interferes with athletic success. The exact results of these two track meets are shown in the following tables, which are taken from *The Student Who Smokes*.

I. WINNERS OF EVENTS IN INTRAMURAL TRACK MEET
AT ANTIOCH COLLEGE, MAY, 1924

<i>Event</i>	<i>First Place</i>	<i>Second Place</i>	<i>Third Place</i>
100 yards dash.....	H	N	—
Shot put.....	M	N	(H)?
220 yards dash.....	N	N	—
Pole vault.....	N	N	—
Javelin throw.....	N	L	—
Half-mile run.....	N	N	N
440 yards run.....	N	—	—
High jump.....	L	N	N
Mile run.....	N	N	N
Broad jump.....	L	N	N
Discus throw.....	N	(N)?	N
Relay team.....	N	N	L

N = Nonsmokers

L = Light smokers

M = Moderate smokers

H = Heavy smokers

II. WINNERS OF EVENTS IN INTERCOLLEGIATE TRACK MEET
AT ANTIOCH COLLEGE, May, 1925

<i>Event</i>	<i>First Place</i>	<i>Second Place</i>	<i>Third Place</i>
100 yards dash	N	N(v)	N
Shot put	H	H(v)	N(v)
220 yards dash	H(v)	N	H(v)
Pole vault	N	N	N
Javelin throw	N	H	N(v)
Half-mile run	N	N	N(v)
440 yards run	H(v)	H(v)	N
High jump	N	N	N(v)
Mile run	N	N	N(v)
Broad jump	N	N	M
Discus throw	H(v)	H	N(v)

(v) indicates member of the visiting team

N = Nonsmokers

L = Light smokers

M = Moderate smokers

H = Heavy smokers

Certain conclusions may reasonably be drawn from this study. Apparently some men have such good athletic ability that they can win events even though they smoke regularly. On the other hand, it seems that when there is competition among a large group of men it is likely that more of the winners will be found to be nonsmokers than smokers.

Sometimes the argument is raised that good athletes refrain from smoking because they fear that smoking will injure their ability, and hence we naturally find that most athletes are nonsmokers anyhow. Professor Earp questioned Antioch students in regard to this. He asked: (1) Why do you smoke (or abstain from smoking)? and (2) Have you a school letter and have

you a college letter? Only 2 of the 176 nonsmokers said that they refrained from smoking because of its possible effects on athletics.

The comparison of the men who had won their letter in school and in college was very interesting. Out of 177 smokers, 74 gained their letters at high school or preparatory school, but only 21 of these won their college letter. Out of 176 nonsmokers, only 56 gained letters in high school, but there were 21 of them who won college letters.

Professor Earp draws the conclusion that the boy in school who succeeds as an athlete joins a rather "heroic" group where he is tempted to smoke, perhaps, more than other boys in the school. If he does yield to the temptation to take up smoking, his career as an athlete is less likely to be successful. This theory is still further supported by the fact that, out of 60 Antioch students who began to smoke during high school days, 37 have school letters, while only 3 gained college letters.

The effect of smoking upon scholarship was also studied at Antioch. Smokers were found to vary much more in scholarship than nonsmokers. Both groups have men among the honor students, but the lower scholarship places are entirely filled by the smokers, so that on the whole the nonsmokers have a higher average of accomplishment than the men who smoke.

These studies by Professor Earp are very interesting because they were made carefully, in a fair and scientific way. They seem to indicate that nonsmokers are better

athletes than smokers, and that smoking hinders scholarship.

There is certainly no evidence that smoking improves health, and there is general agreement among doctors that excessive smoking is injurious. Just how much smoking is necessary to produce injury, or just what is the effect of smoking in a moderate amount, is hard to say. Studies upon lung capacity and heart efficiency do not show much difference between smokers and nonsmokers. We do not know whether smoking interferes with the efficiency of the body or lessens ambition in some way. If it should be found that smoking makes one less interested in securing success in athletics and scholarship, the charge against tobacco would be more serious than it would be if it merely produces a slight physical injury.

There is some difference of opinion on the subject of smoking for adults. There is, however, no disagreement as to the injury from smoking for boys who have not attained their growth. Doctors and educators are unanimous in their belief that the growing boy hinders his desired development by the use of tobacco. Smoking appears to affect the appetite of the growing boy. He does not get the necessary amount of food. Possibly another harmful effect is a tendency to make the boy nervous, so that he fails to get enough sleep and rest. Whatever the scientific reasons may be, it is certain from observation of boys everywhere that those who smoke in their early teens fail to develop well in body

and mind. It is also common experience that when they break the habit they improve.

Cost. — Surely another practical argument against smoking is the cost. The amount of money spent for tobacco in this country has increased by leaps and bounds, until we find that more money is spent for tobacco than for all educational purposes. From the standpoint of the individual, it seems a pity that a young man should spend money constantly for tobacco at a time when he needs all his money to secure a good start in life. From the viewpoint of the community, it is unfortunate that such large sums should be spent for something which impairs efficiency.

ALCOHOL

It is said that the early colonists brought with them to this country the drinking customs of their mother-countries of the sixteenth and seventeenth centuries. Drunkenness was an especially serious matter, however, in a new country where everybody must work, where dangers from the Indians were ever present, and where men must be ready for instant action. The colonists, therefore, began to make laws punishing drunkenness. From that time the fight against alcohol has grown, until finally the Eighteenth Amendment to the Constitution of the United States went into effect. It prohibits the manufacture and sale of alcoholic liquors throughout the country.

Let us consider some of the facts about alcohol which



THE ATHLETE AVOIDS HARMFUL SUBSTANCES

(Reproduced by permission of the sculptor, R. Tait McKenzie, and the photographer, The Black and White Studio, of Philadelphia)

cause it to be regarded as such an enemy of mankind. Most of you know that alcohol is one of the waste products thrown off from yeast plants when they grow in a sugar solution. The light wines and beer are made by allowing yeast cells to grow in grape juice or barley

liquor. The stronger liquors are made by a process of distillation.

Effects of alcohol. — Alcohol, like nicotine, is a narcotic. Its effect upon the body is to slow down the heartbeat, the respiration, and the activity of the nervous system. Many people make the mistake of thinking alcohol a stimulant. Under the influence of alcohol, people are likely to think that they are brighter or more clever, when, as a matter of fact, the contrary is true. It is said that a young mountain-climber, after taking a drink, boasted that "he could jump like a bird." "No," replied an experienced mountaineer, "you mean like a fool."

It is an accepted fact that alcohol hinders athletic success. Men in training for any kind of sport are not allowed to use it at all. One of America's foremost baseball managers is quoted as saying that "Old Man Booze has put more men out of the game than all the umpires together."

The Carnegie Institution of Washington has issued an interesting report on "Alcohol and Human Efficiency," by Dr. Walter R. Miles. Dr. Miles used a clever apparatus, called the "pursuit-pendulum," to test the effects of alcohol upon a person's ability to respond quickly. This has also been used to test men for aviation service. A pendulum carries a reservoir filled with water which is allowed to flow out from the bottom as the pendulum swings. The test is to catch the water in a series of cups as it escapes from the moving pendulum. Constant

attention and alertness are necessary to meet this test. Seven out of eight men tested did less accurate work after taking only small amounts of alcohol. Dr. Miles says that if the task were a factory process the effect of the alcohol would be sufficient to reduce markedly the men's efficiency.

The effect of alcohol upon alertness and quickness has also been tested with animals. In one experiment white rats were treated with alcohol fumes daily for twenty-eight days. Then they were trained to run through a circular maze, and were treated with alcohol daily, as before. They took more time per trial in running through the maze than did their brothers and sisters who had not been treated with alcohol.

Because of the lack of control which is associated with the use of alcoholic liquors, drinking leads to an increase of accidents. It is interesting to know that the organization of the railroad engineers in the United States, known as the Brotherhood of Locomotive Engineers, has a strict rule requiring total abstinence at all times on the part of the members. The president of the organization is quoted as saying:

"When you realize that on these fast trains the engineer must recognize and correctly interpret three signals a minute on an average . . . you can understand why every sense must be alert. We who have spent most of our lives on locomotives know the . . . fraction of a second of time that often means safety. Alcohol slows down the brain. Any member of the



ENGINEERS DO NOT DRINK ALCOHOLIC LIQUORS

Brotherhood found guilty of violating the rule which forbids the use of alcoholic liquors either while on duty or while off duty must be expelled, and any lodge of the Brotherhood failing to enforce this law must have its charter suspended by the head of the National Brotherhood.”

For a long time physicians have been impressed with the fact that alcohol is a factor in shortening life. In one general investigation of the impressions of doctors as to the importance of alcohol in causing death, it was found that alcohol was believed to have played a part in about 14 per cent of 10,000 deaths which were classified. A scientist who has spent years in

the study of the effect of alcohol upon the length of life says that heavy drinking certainly shortens life.

There are probably many reasons why this is true. It has been found by scientific study that excessive use of alcohol weakens the defense of the body against disease germs. Undoubtedly people who lack self-control in the use of alcohol are commonly unreasonable in their other habits of living too, and thus injure their health. Men who are heavy drinkers are looked upon as poor "risks" by the life-insurance companies.

Since the Prohibition Law was passed, some people who do not want the law insist upon getting liquor in unlawful ways. Out of this a new danger has arisen. Drinks are manufactured from wood alcohol and other poisonous substances, which affect the body even more seriously than does pure alcohol. There have been cases of blindness from the use of such liquors, and, indeed, a large number of deaths.

Alcohol and society. — We have considered the effects of alcohol only from the standpoint of injury to the individual. There is much to be said in regard to the community problem. It appears that men do less work when they use alcohol; this means loss of production for the community. Certainly alcohol increases the accident rate, which means loss of life and destruction of property. Heavy drinking unquestionably shortens the length of life, which again means less production. Alcoholics fail in their responsibility as good citizens. Many of them become burdens upon public money.

Another problem is that of caring for the alcoholic insane. During a five-year period, in Massachusetts, the admissions to the State Hospitals were as follows:

Number of persons admitted for alcoholic insanity	Per cent of alcoholics in the total number of persons admitted
215	6.41
222	7.83
237	8.08
176	5.94
188	6.49

Is it not a pity that tax money should be spent in caring for people who have brought themselves to a helpless condition through the use of alcoholic liquor?

Another problem is that of dealing with criminals. Because of the effect of alcohol upon the brain, men do things after they have been drinking heavily which they would not do otherwise. How commonly we read in the daily papers of crimes committed by persons under the influence of liquor! These men have to be tried in court, and they have to be cared for in the jails and penitentiaries. Do you have any idea what it costs your state each year to take care of criminals? Not all criminals are alcoholics, by any means, and undoubtedly some criminals who are alcoholics would have committed crimes even without liquor. We do feel certain, however, that the use of alcohol is an important factor in increasing crime.

The community has to spend money also in caring for

families which are neglected by drunken parents. Some of these are the families of the alcoholic insane and the criminals. Others are those families which find themselves in extreme poverty because of neglect.

DRUGS

There are many narcotic drugs which are perhaps even more dangerous than alcohol, because of their powerful "habit-forming" effects. Once a person has developed the drug habit, it is almost impossible to break it. He is so miserable without the drug that he will go to any extreme in order to get more. As a result, there is loss of self-control and self-respect, as well as loss of health. Among these harmful drugs are opium, morphine, cocaine, heroin, and chloral.

Some people have formed the drug habit by taking the drugs first in patent medicines. In fact, the danger from patent medicines was so great that the sale of these products is now controlled by national laws. The Pure Food and Drug Act requires that all patent medicines shall be honestly labeled. The Harrison Narcotic Law restricts in a definite way the sale and use of the habit-forming drugs.

Patent medicines which are advertised to cure everything or to accomplish a variety of unreasonable results are poor investments. You need to remember in reading an advertisement that the producer is anxious to sell his product and make money. He is interested in *you*

chiefly as a possible customer. There are, of course, a few simple remedies which can be used in the home for slight ailments. When a person is ill enough to need "medicine," however, the sensible thing to do is to call a physician.

Some of the dangerous drugs are useful in the hands of skilled physicians to reduce pain for those who are ill and suffering. They cannot be purchased without a doctor's prescription.

Habit-forming drugs also increase the amount of insanity and crime. Is it not a pity that human beings should develop these tastes which, at the end, lead to misery both for themselves and for others?

PROBLEMS AND PROJECTS

1. What advantages should a country receive from prohibition?
2. Make a list of all the harmful effects of alcohol.
3. Make a list of reasons why a boy ought not to smoke during his growing years.
4. What things should you like to have done in your community for the promotion of health if you could spend the money which is spent every year for tobacco?
5. Answer the questions at the beginning of the chapter.

VII

WASTE DISPOSAL

What are the household wastes?

How are rubbish and ashes disposed of in the country? In the city?

What can be done with food wastes from the kitchen?

How does the disposal of wastes in cities differ from that in the country?

What discoveries have introduced new methods of sewage disposal in cities?

Rubbish, ashes, and kitchen waste. — The hunter or the camper, on the great plains or in the forest, has little difficulty in disposing of camp wastes in a sanitary way. The ashes of his camp fires are left where they are, and if he has a few pieces of food left they are either thrown into the fire or buried. The disposal of such wastes on the farm is equally simple. Ashes from the stove can be dumped at any convenient place away from the house. Sometimes a farmer scatters the wood ashes over his fields to enrich the land. Sometimes wood ashes are stored to be used later for the purpose of extracting lye for soap making. Most of the soap used by the pioneers was homemade soft soap. Broken dishes and other rubbish are dumped in the woods where they will bother no one. The scraps of kitchen waste are fed to pigs or chickens.

In the city, however, the problems are more difficult. The ashes which accumulate soon fill the ash cans in the basement. City teams come regularly to collect the ashes and haul them away to fill low land. Rubbish is collected and taken to the dump. In some cities both rubbish and ashes are burned in big furnaces called incinerators.

The kitchen waste must be collected every two or three days. It may be carried outside the city and fed to pigs, or it may be treated by what is called a *reduction process*, in which the garbage is cooked in large tanks so that the grease can be removed and sold. What is left after the grease is removed is put with other materials to make commercial fertilizer which is sold to farmers to enrich the land. In a few cities the garbage is burned with the rubbish.

Sewage disposal. — If you live in a city, you probably know that the drains from the house run into the street sewer, which carries the drainage off to some distant point. This pipe carries all the waste water from the house — from the sink, ice box, bathtub, lavatory, and toilet. The waste water from factories is carried off in a similar way. In some cities rain water from the street goes into the same pipe. In other cities there is a separate set of pipes to carry off the street water.

The waste which is carried off through these pipes is called *sewage*, and the pipes themselves make up the *sewerage* system of the city. Even when one realizes how much water comes into these pipes from houses and

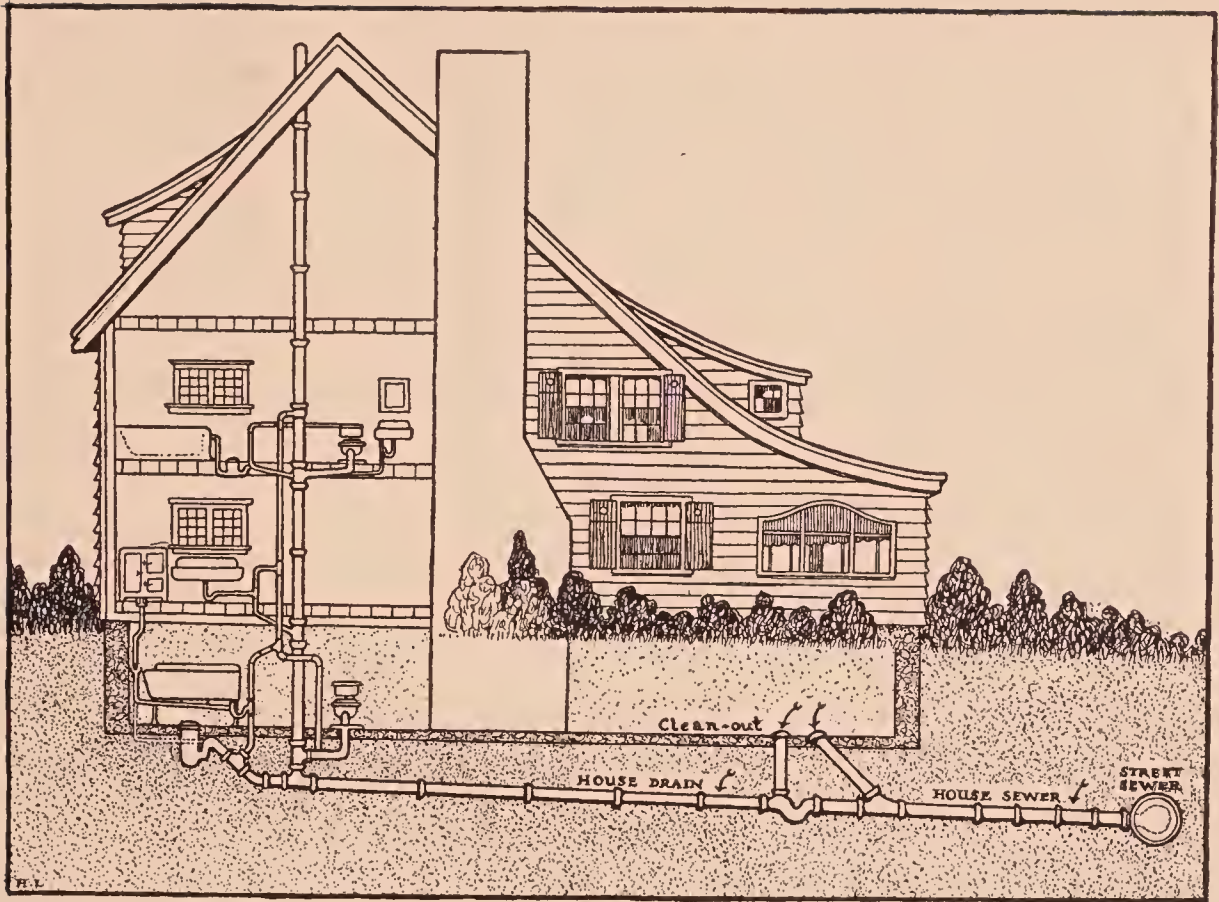


DIAGRAM SHOWING HOUSE SEWER AND PLUMBING

factories, it is a little surprising to know that the sewage in a city amounts to nearly one hundred gallons per day for every person in the city. What is the population of your town or city? From it you can determine how many gallons of sewage must be disposed of daily through the sewerage system.

Direct disposal of sewage. — One of the easiest ways to dispose of sewage is to let it flow into a large river or lake, or into the ocean. When a city is located on some large body of water this is usually the method of disposal. The sewer pipe extends into deep water. Cities which are located on the ocean sometimes hold the sewage in large tanks until the tide is going out, and then

discharge it into the ocean so that it will be carried out to sea. The useful bacteria in the water purify the sewage, changing it into harmless material.

Sometimes a city cannot discharge its sewage into a river or lake conveniently because of the danger of polluting the water supply. Chicago disliked to discharge its sewage into Lake Michigan because lake water is used for drinking purposes. Consequently a drainage canal has been dug from Chicago to a stream which flows into the Mississippi River. The sewage is carried away from the city through this canal. Sometimes a city which is located on a river cannot discharge sewage into the river because some other city, not many miles away, uses the river as its water supply. In such a case it is necessary to purify the sewage.

In the simplest methods of sewage disposal nature turns the materials back into soil. Every one knows that it takes rich soil to make good gardens. Almost every soil that produces crops may be made richer by adding something to serve as fertilizer.

What kinds of fertilizer do you know about? If you have planted a school garden, you probably bought specially prepared commercial fertilizer in a bag at the store. If you live in the country, you know of the use of animal manure which is hauled out from the barns and spread on the fields for fertilizer. In 1621 the Indian, Squanto, taught the Pilgrims at Plymouth to put a fish into each hill of corn when they did the planting. The fish was used as fertilizer.

From your work in gardens and from your study of *Cleanliness and Health* you have learned the nature of rich, dark, soft, moist soil, and you have seen how it differs from clay or gravel. Do you remember how humus soil is made?

If apples are allowed to stay on the ground and rot they gradually turn back into soil. The fish which Squanto dropped into the hills of corn rotted and enriched the soil. The parts of all plants or animals are eventually changed back into soil by the action of useful bacteria. Leaves falling to the ground form layers which become deeper year after year. When you dig down into the leaves in the forest you find that the layers which are six or eight inches from the top have turned into dark, rich soil. This principle has been used in the disposal of sewage.

Sewage farms. — In Paris, and in some other cities, a process of sewage farming has been developed. The sewage flows out upon dry land. It enriches the soil and is purified as the water soaks into the ground. Of course the water does not soak into the soil very rapidly. Consequently a great amount of land must be used for this purpose. The process of sewage farming has been a useful one, however. It may be used wherever the soil is sandy, because the bacteria in the sewage and on the sand will turn the waste substances back into soil.

Intermittent sand filter. — As cities grew and land became scarce the problem of purifying sewage became more and more difficult. Sanitarians sought a method

of purifying sewage more rapidly. In 1887 the state of Massachusetts; through its State Board of Health, decided to study this problem, and a special experiment station was established at Lawrence.



THE HISTORIC LAWRENCE EXPERIMENT STATION

(Reproduced from *State Sanitation*, by G. C. Whipple, by courtesy of the Harvard University Press)

The station was housed in a small wooden building located near one of the big sewers. The studies were made under the direction of Hiram F. Mills, C. E., a well-known water-power engineer of the State Board of Health. Professor Thomas M. Drown of the Massachusetts Institute of Technology was Consulting Chemist, and Professor William Thompson Sedgwick of the same school was Consulting Biologist.

People had known for a long time, of course, that soil would purify body wastes, but they did not know how. It seemed worth while to run sewage through different kinds of soil to see what would happen. Several large tanks made of cypress wood were built in the ground and filled with sand. Sewage from the city pipes was run into these tanks and allowed to soak through.

Professor Sedgwick, in his delightful manner, tells of the experiment, as follows:* “No experiments of this kind had ever before been undertaken on such a scale or with so much care. For the first time in the history of science, engineers, chemists, and biologists worked together under the direction of a master in hydraulics toward one common end — the promotion of the public health. . . .

“Intelligent bystanders, who saw the sewage flowing upon the filters, at the outset unhesitatingly predicted failure. They felt certain, and did not hesitate to express their belief, that in a fortnight, at the latest, the filters would become clogged and foul, and the whole neighborhood pestilential. They did not know that Berlin, the German capital, disposes of all its sewage upon the land. They forgot that the farmer, once a year, or oftener, manures his fields with filth and that the hungry earth receives the gift with open mouth, devours it, and soon cries out for more. As soon as a few days had passed, and the filters had become established, the effluent began to grow bright and clear.

* SEDGWICK, W. T.: *Principles of Sanitary Science and the Public Health*.



SAND FILTERS FOR SEWAGE PURIFICATION

(Reproduced from *State Sanitation*, by G. C. Whipple, by courtesy of the Harvard University Press)

Further studies revealed the fact that the foulness of the sewage was not held back as by a strainer; but rather that, as wood by a slow fire is turned to ashes, the organic matters here were slowly reduced to mineral substances. No disagreeable odor developed and the filters showed no signs of clogging. Thus the very name 'filter' became a misnomer. The bystanders were amazed, and could not repress their feelings of surprise and admiration."

It was discovered that if the sewage was allowed to run through the sand continuously the filter would clog and become foul. If the filter was used for a day or two and then rested for a few days, however, the purifica-

tion process was almost perfect. What could be the reason that the filter worked better after being rested?

Here is what the scientists discovered. When the sewage began to run through the soil the useful bacteria, which carry on the purifying process, collected on the top layers of the sand. As they increased in number they made a kind of jelly, just as acetic-acid bacteria form a jelly which is called "mother of vinegar." The bacteria of the filter formed a coating of jelly covering the grains of sand. All particles of any sort stuck to the jelly material and *the bacteria purified the sewage*. In the sand filter, as in the garden, the useful bacteria turn the waste substances of plants and animals into the mineral substances of the soil.

These particular bacteria, however, must have plenty of oxygen from the air in order to "breathe." The air which is dissolved in the sewage is not sufficient, and the filter must be rested every few days in order to give the bacteria the air they need. When the bacteria have covered the sand grains with their jellylike growth the process of sewage purification becomes rapid and efficient. The water which soaks through the sand is clear. In fact, when analyzed by the chemists and bacteriologists, it is found to be quite pure — as pure as water from ponds or rivers.

Thus science has found out how to speed up the process of nature. Because of the presence of so many helpful bacteria, the sand filter can do in a few hours the work of purification which requires several weeks in

ordinary soil. Such a sand filter, an acre in area, will take care of sixty to eighty thousand gallons of sewage a day.

Sprinkling filter. — After the studies at the Lawrence experiment station, sand filters were built in many towns all over the country. Other studies in sewage purification were undertaken, some of which resulted in the development of the rock filter or *sprinkling filter*.

In this filter a sloping concrete floor with drains is first built. Then small broken rocks, an inch or two in diameter, are dumped upon this concrete floor until a filter about six feet deep is made. The sewage is sprayed upon the top of the filter through nozzles which throw out a spray like that thrown by a sprinkler upon a lawn.



A SPRINKLING FILTER

In this filter, as in the sand filter, the work is done by bacteria. They form their jellylike growth over the surface of the rock and purify the sewage as it passes through the filter. In this case the process of filtration is stopped every few minutes to give the filter a chance to "breathe" — that is, to allow air to make its way between the rocks. The purification process is not quite so complete as in the sand filter, but it is much more rapid.

Use of cesspools and tanks. — A quite different process of sewage purification is found when the sewage is left in cesspools or tanks. In this case useful bacteria of quite a different type are at work to change the solids of the sewage into liquids. These bacteria are strange plants, in that they do not need air. Most bacteria, like animals, get from the air the oxygen which keeps them alive. The bacteria which grow in cesspools need oxygen, too, but they get it from the waste substances in the sewage. This bacterial process is called *sepsis* or *putrefaction*. An example of this kind of bacterial action is seen when soup or meat stew "spoils," or becomes putrid. When kept in a warm place liquids of this sort will always spoil if certain bacteria are present. You know well enough from the unpleasant odor of spoiled soup that the substance of the soup has been changed.

Perhaps you know of cesspools near houses in the country or at a summer cottage. Usually a cesspool is built by digging a hole in sand or gravel soil and making a wall of railroad ties or big rocks. The house drain

runs into this pit and the water soaks out into the surrounding soil. Cities build large concrete *septic tanks* in which bacteria destroy waste substances in the same way as in a cesspool.

Purification process in one city. — Perhaps you would be interested in the story of the way in which one particular city disposes of its sewage. About sixty-five thousand people live in this city, and there is no large body of water near at hand into which the sewage may be discharged. The sewer pipes run down to the lowest land in the city, where there are big pumps which pump the sewage two miles into the country to a purification plant. Here the sewage is first sprayed upon a sprinkling filter. Then it flows through a large tank to sand filters where the purification is completed. The water from the purified sewage runs into a small brook.

Although the water which runs into the brook is clear, it still contains some dissolved material which serves as food for bacteria. Nature continues the purification process in the stream. At the place where the drainage from the sand filters flows into the brook, there are many thousands of bacteria in every thimbleful of water. A little farther down the stream the water is found to contain small single-cell animals which feed upon the bacteria. These little single-cell animals also have their enemies. Many plants and animals play a part in purifying the brook. The bacteria feed upon the dissolved material in the water; various animals feed upon the bacteria and upon each other. If you study biology and

chemistry in high school, you will learn more exactly how these changes take place.

There is a motion picture called *Waste Disposal in Cities* which your class may be able to borrow from your State Department of Health.* This motion picture shows in detail the process which has just been described.

Reasons for waste disposal. — It is not difficult to understand why the body waste must be purified so completely. The germs of certain communicable diseases like typhoid fever, cholera, or dysentery are thrown off in the body wastes and may find their way to a well person through drinking water. Here is the story of a typhoid fever epidemic in the city of Plymouth, Pennsylvania. It illustrates the danger of failing to dispose of body wastes properly.

In 1885 Plymouth was a mining town of about eight thousand people. It had a good water supply, which came from a mountain stream, and there were only two houses upon the land which drained into this stream.

On April 9 one of the doctors in town was called to see a person who had typhoid fever. Nobody worried very much about a few cases of typhoid fever in those days, because the disease was rather common. But new cases appeared every day. During the week beginning May 12 there were from fifty to one hundred new cases daily, and it is said that on one day two hundred new cases were reported. Imagine the anxiety of the people!

* Prepared by the authors and available from the Society for Visual Education, 327 South LaSalle Street, Chicago, Illinois.

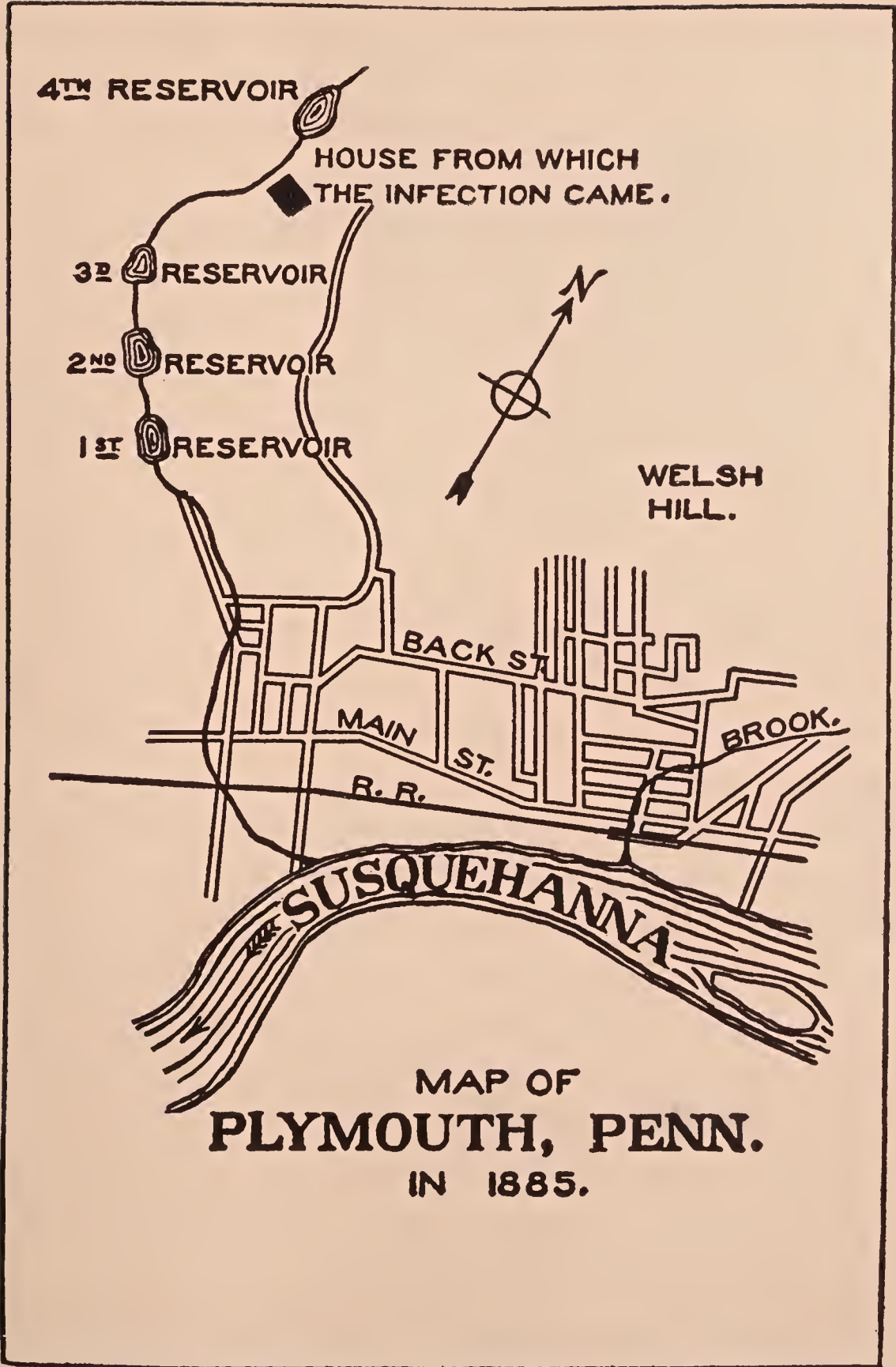
One could not know when his father, or mother, or friend, or he himself would come down with the disease. Within a few weeks 1104 people had contracted typhoid fever and 114 had died.

What could be the cause of such a widespread epidemic? Some thought it might be due to drinking polluted well water; others thought it might be due to infected milk. Many vague and unscientific notions were advanced which were not based upon the then new, but sound, knowledge that typhoid fever is a germ disease.

The map which is shown here will help to explain what really happened. In one of the houses near the brook lived a man who had typhoid fever during January, February, and March. The body wastes from this patient were not disinfected as they should have been, but were thrown out into the snow at some distance from the house. The germs remained alive in the frozen snow, and when the warm weather of April came the snow and the pollution were washed into the brook.

Even so, the water of the brook might have purified itself, and the city might have been saved from the epidemic, if there had been a long period of storage for the water in the reservoirs. We shall see in a moment that the usual period of storage did not exist.

The story of this epidemic in the First Annual Report of the State Board of Health, 1886, explains that there had been little water in the reservoirs during the late winter. On March 26 there was a thaw, and the brook



(Reproduced from *Sanitary Science and Public Health*, by W. T. Sedgwick, by permission of The Macmillan Company)

began to rise. The Superintendent of the Water Works, in visiting the reservoirs, found the first and second reservoirs almost empty. The third was filling rapidly, but the discharge pipe was tightly frozen.

The report says that he caused a fire to be built, which melted the ice in this pipe. The water, with its accumulated typhoid fever germs, was discharged from the bottom of the third reservoir; it ran down to the second, on to the first, and thence was distributed to the town, without any storage or purifying process.

Thus we have the story of "one patient poisoning more than a thousand" people. Probably the drainage from this house had gone into the stream for some time, perhaps for years; but when the germs of typhoid fever were added to the ordinary pollution this serious epidemic took place.

Sanitation in the country, at cottages, or while camping. — Water-borne epidemics like the one just described show the penalty which must be paid for lack of care in maintaining sanitary conditions. Such epidemics are very rare now because cities purify sewage and keep a careful watch over their water and food supplies. In the country the responsibility for waste disposal and for getting pure drinking water rests upon individual families. There is more typhoid fever in the country than in the city at the present time.

Surely none of us who have learned the importance of sanitation will endanger ourselves or other people by our carelessness. People who live in the country must

be sure that the privy is sanitary and that there is no possibility of the well becoming polluted. Your State Department of Health will be glad to send you material describing the construction of sanitary privies. In any case, the privy must be built so that flies, rats, or other animals cannot get under it and later spread disease.

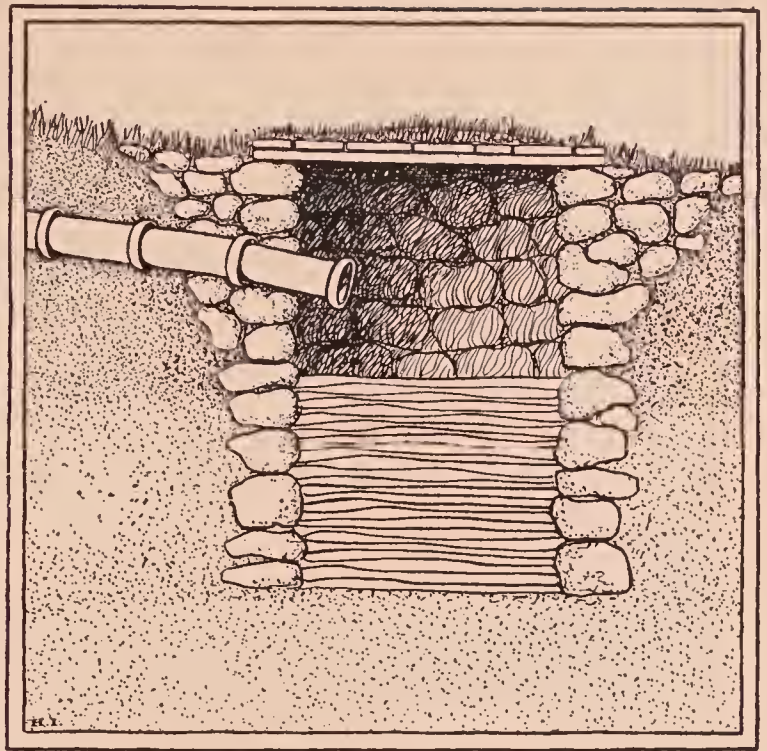


DIAGRAM OF A CESSPOOL

People who are camping in the country must be careful not to pollute the water supply, and they must be careful to secure drinking water which is pure and unpolluted. The good camper is careful to leave the camp site clean and sanitary in every respect. He burns all food scraps which are left. Pasteboard and paper are burned. No rubbish is left about. Be a Golden Rule camper.

REVIEW QUESTIONS

1. What is rubbish? Garbage? Sewage?
2. How do bacteria help in the purification of sewage?
3. Why must body wastes be properly disposed of or purified?
4. What rules concerning waste disposal and water supply should you follow when you are camping?

VIII

OTHER PROBLEMS OF CITY HOUSEKEEPING

Is there any health problem involved in keeping pigs, hens, or other domestic animals in the country? In the city?

Why and how do we try to get rid of rats and mice?

Where do flies breed?

Why and how do we try to exterminate flies?

How do cities make war upon the mosquito?

Is there any reason for making rules to control the types of buildings which may be built in different parts of a city?

Why should a city make regulations concerning the construction of houses?

In order to make a city a clean and healthful place in which to live, some one must "do the housekeeping." If a farmer is careless and slovenly he and his family are the only ones to suffer, because neighbors are some distance away. In a city people live so near together that a man who is careless, or who selfishly disregards the welfare of others, seriously interferes with the comfort of his neighbors. For example, if a city man keeps pigs or hens at the back of his own lot or in a back yard, disagreeable odors may trouble his neighbors who live nearer the animals than he does. Many cities, therefore, do not allow these animals to be kept within city limits.

You can think of other examples which show the necessity of city regulations in the interest of health and

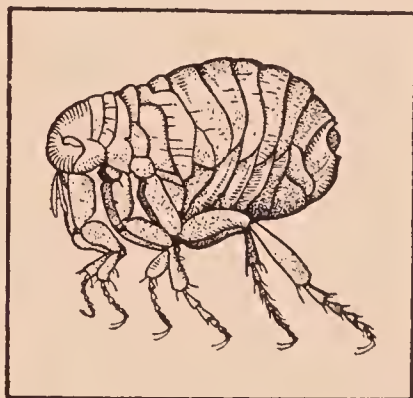
comfort. We are to consider in this chapter some of these sanitary problems.

Rats and mice. — We try to get rid of rats and mice in our homes because they nibble our food if they have a chance. They are dirty and destructive pests. The rat is more dangerous than the mouse because, in addition to being troublesome, it is sometimes the means of spreading a disease called “plague.”

The spread of plague is an interesting study in animal relations. When the plague bacillus gets into the body of the rat it causes a disease (rat plague) which is frequently fatal. But how does the germ get from a sick rat to a well one? It is carried by the rat flea.

When a flea bites a sick rat, it picks up the plague bacilli. Strangely enough, the bacilli do not cause any trouble to the flea. They live and grow in its digestive tract. When this flea gets upon the body of a well rat it transfers the plague bacilli to a new host, thus spreading the disease.

How does the rat give the plague to human beings? The flea is the culprit in this case. When the flea gets upon the body of man and bites, it spreads the disease to him. This means that if the rats in a city become infected with plague, the people are pretty sure to get the disease too. We should remember that well rats do not have plague, and that it is only when they do have



THE RAT FLEA

the disease that they can pass it on to man. It is possible for a city health department to find plague in rats and stamp it out by killing them before any person catches the disease.

Cities must try, therefore, to prevent the breeding of rats. This is particularly true of cities on the seacoast, because there is some danger that rats which have the plague may be brought on ships from some other city and start the disease among the rat population. Ships are usually kept a bit away from the wharf. The ropes which hold them in place have rat guards upon them so that rats cannot get aboard the ship or leave it by means of these hawsers. The rat guards are made of metal; they look like a tin pan with a hole in the bottom, through which the hawser rope has been pulled.

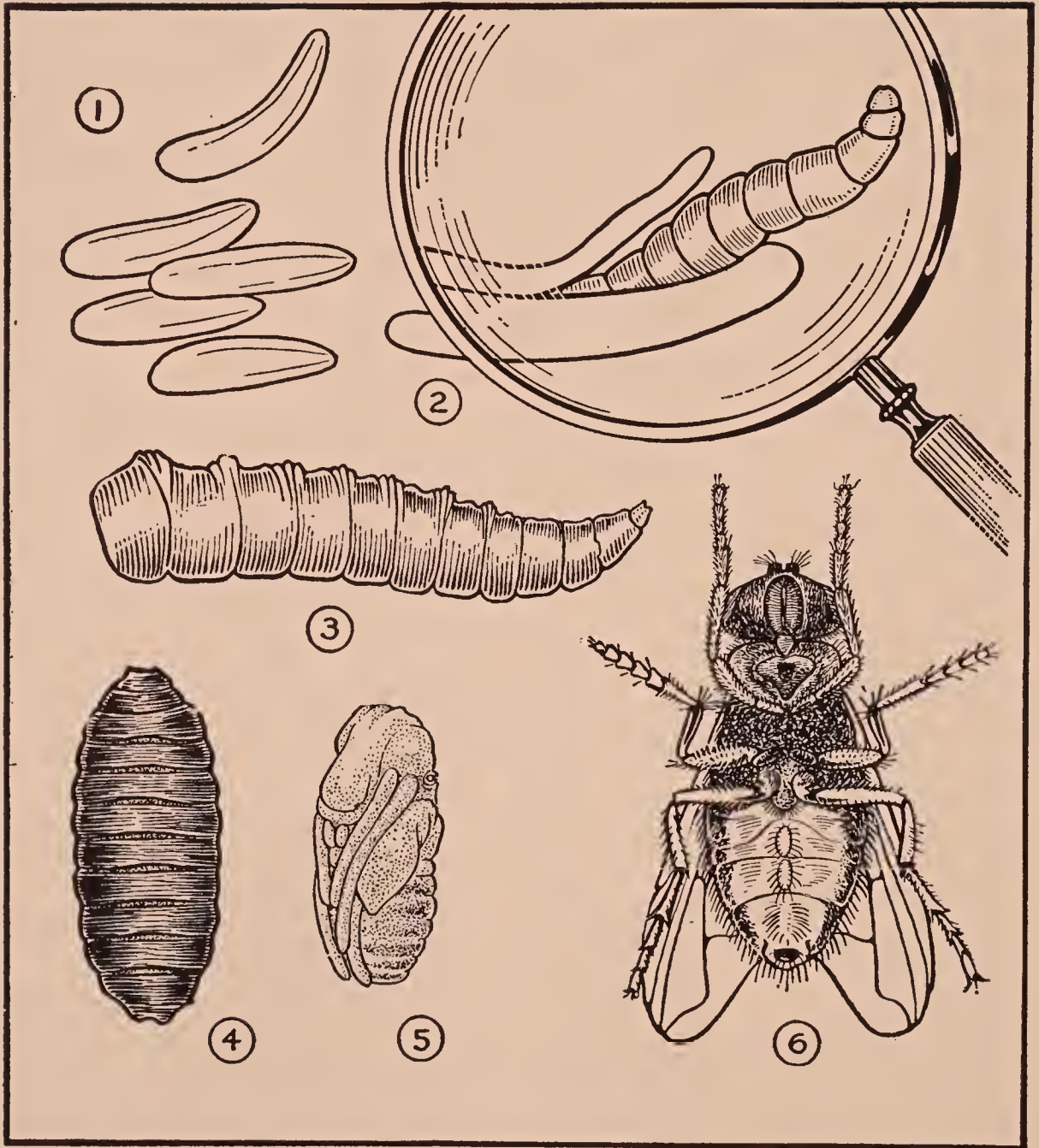
Probably you have already rid your house of rats and mice by setting traps for them, or perhaps your house is so well constructed that no rats or mice ever got into it. Even if every house in the city were free from these pests, they might still live in stores or factories or old buildings. The city tries to prevent the increase in the number of rats and is continually fighting them by various methods. Rats are killed by fumigating old buildings, by trapping, or by using poison bait. Some cities have rules concerning the construction of buildings, requiring that they shall be rat-proof. Other methods of rat control are to keep garbage covered so that rats cannot feed upon it, and to prevent the accumulation of rubbish where rats can gain shelter.

Fly control. — Can you give the life history of a house fly? In *Cleanliness and Health* you have read that the house fly lays its eggs upon animal manure, in garbage, or on some other decaying substance. Within a few hours the eggs hatch into larvæ which are called maggots. The maggots eat almost continuously and grow rapidly. After four days they turn into pupæ. The pupa is a resting stage, during which the animal does not feed but undergoes a marked change in body structure. At the end of about four days more the fly breaks the shell of the pupa case and comes out.

Under favorable conditions for growth, there is a new generation of flies every ten or fifteen days. You know that flies not only light upon people and food; they also visit places of filth. Sanitarians have proved that they can carry the germs of certain diseases from one place to another. Some towns which have had no sewer system have reduced the number of cases of typhoid fever by requiring that all privies must be made fly-proof.

One of the most important ways to combat flies is to do away with breeding places. Flies prefer to breed in animal manure. The city, therefore, must see that stables are properly kept. Either the manure is removed every week or something is thrown upon it to prevent the breeding of flies. Borax (about ten ounces for eight bushels of manure) is commonly used. The use of automobiles and trucks instead of horses has helped to reduce the number of flies.

The city often urges a campaign against flies, partic-



LIFE HISTORY OF THE HOUSE FLY

- | | |
|--------------------------------------|--|
| 1. Eggs of the house fly | 4. Pupa in case |
| 2. Larva or maggot hatching from egg | 5. Nearly developed pupa |
| 3. Larva | 6. Mature house fly as seen when walking up the outside of a window pane |

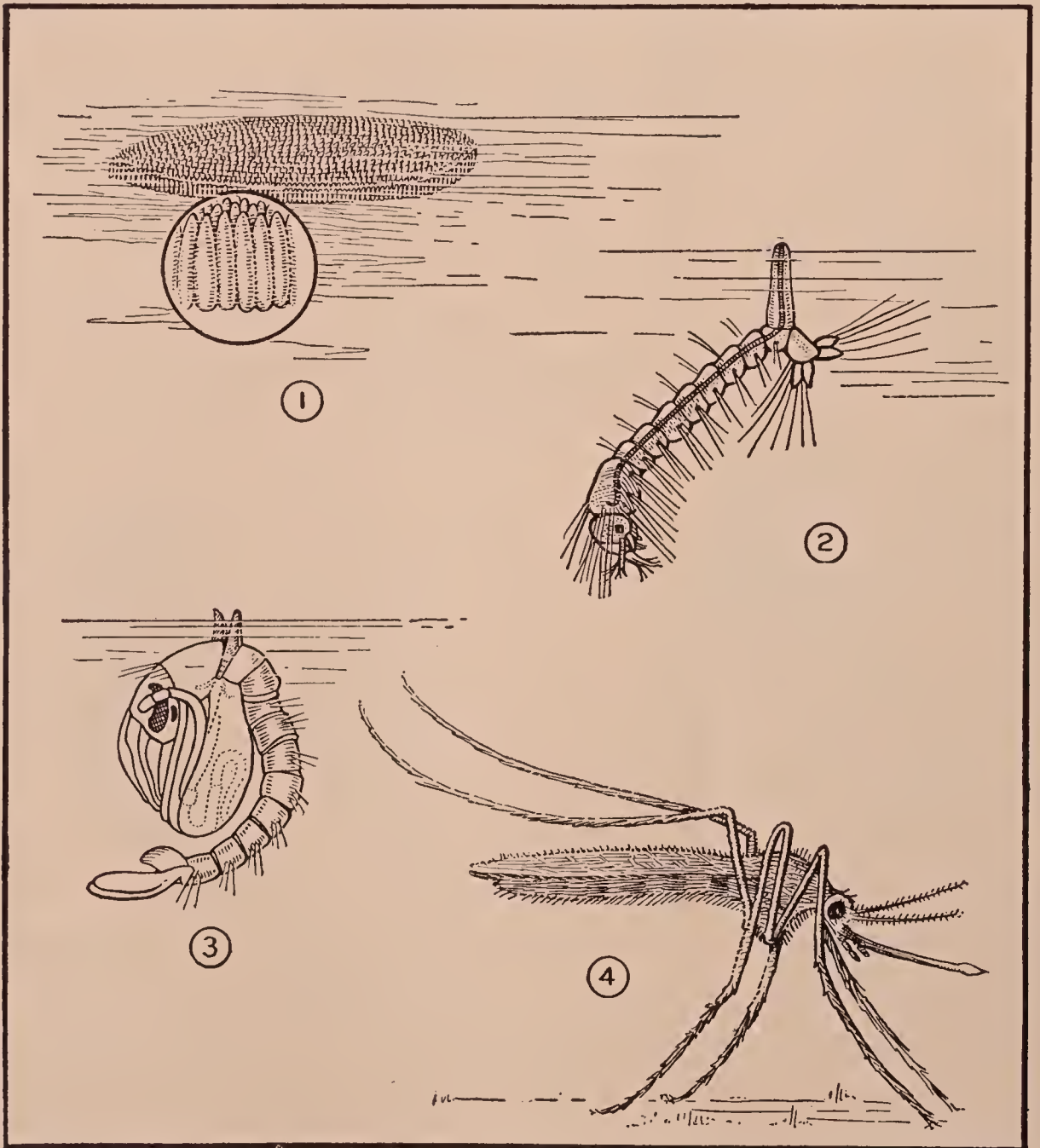
ularly at the beginning of the fly season. City regulations require that restaurants and food stores shall be properly screened so that the food will be protected from flies. They require also that garbage shall be kept where it does not allow flies to breed.

Mosquito control. — You recall from your previous study of mosquitoes that they are enemies of both comfort and health. Most varieties of mosquitoes produce merely discomfort from the sting and the itching which follows it. But the *Anopheles* mosquito transmits malaria and the *Ædes* mosquito transmits yellow fever. This fact makes mosquito control one of the duties of the modern city. Yellow fever is now very rare, but there are still many sections of the country where malaria is common. In these sections it is particularly important for the government to prevent the development of mosquitoes. Even in those parts of the country where there is no malaria, and where mosquitoes are merely a pest, much is now being done to get rid of them.

How does a city make war upon the mosquito? — A hunter who starts out to kill some kind of animal must know something of the nature and habits of the animal if he is to be successful. The sanitarian who undertakes to hunt down the mosquitoes of a neighborhood knows the life history of the animal he is hunting. He makes war upon the insect at that stage of its development which offers the best opportunity to kill the greatest number with the least labor and expense.

You already know something of the life story of the

mosquito. You have seen pictures of the different stages in its development, and perhaps you have seen larvæ and pupæ themselves and can bring some into



LIFE HISTORY OF THE MOSQUITO

- | | |
|--|------------------------------|
| 1. Mosquito eggs floating in water
(Shown slightly magnified) | 2. Mosquito larva or wiggler |
| | 3. Mosquito pupa or tumbler |
| 4. Full-grown mosquito | |

class. The two most important facts in deciding how to prevent the breeding of mosquitoes are: (1) mosquitoes always breed in water; (2) the larvæ and pupæ must breathe.

The first attack in the campaign is to destroy the



A METHOD OF MOSQUITO CONTROL

breeding places of the mosquito. Low land which has water standing upon it is drained by digging ditches and allowing the water to run off. Small areas of low land may be filled in with dirt or ashes and the standing water eliminated.

A second attack is directed against the larvæ and pupæ of the mosquito. They come to the surface and stick their breathing tubes out of the water to get air. A thin film of crude oil is spread upon the surface of the pool. The mosquito larvæ and pupæ are unable to push their breathing tubes through the oil, and die for want of air.

Another way of killing the larvæ is by the use of a poison, or larvacide. Such a poison, prepared from carbolic acid and other substances, is sprayed on the water in which the mosquito larvæ are developing.

There are certain kinds of fish — the top minnow, for example — which feed upon the larvæ of mosquitoes. These fish may be introduced into ponds or sluggish streams. When this is done the grass near the banks should be cleaned out so that the fish can get at the larvæ.

We can do something to combat the adult mosquito, but it is more effective to eliminate breeding places or to kill the larvæ and pupæ. Every householder should see that rain barrels, gutters, and old cans do not provide breeding places. The adult mosquitoes have some natural enemies, such as bats and dragon flies. If a few mosquitoes get into the house they may be killed in

the dark corners where they usually stay during the day. Good screening will, of course, do much to keep them out of the house.

Swimming pools and bathing beaches. — Who does not like to swim? The thrill of the plunge into the clear cool water and the joy of vigorous swimming furnish real sport. Few activities provide better exercise for all parts of the body or greater enjoyment. If we are to enjoy swimming, some one must see that there is a good place in which to swim. We cannot have private pools of our own, and when we swim in public pools, or at the beaches, we want to swim in water which is clean. From your previous study of sanitation you can understand that it would be possible for infections of the eye, the skin, or the digestive tract to spread from one person to another in the water of a swimming pool.

We must look to the Health Department to see that rivers, lakes, and ocean beaches where swimming is allowed are free from sewage pollution. We expect the Health Department to examine and know the quality of these waters. We expect them to know the quality of water in public swimming pools and to prescribe rules for the operation and conduct of these places. Fortunately indoor and outdoor swimming pools are now becoming so numerous that most people have some opportunity to enjoy the sport of swimming. We must depend upon the city to keep these swimming places in proper condition.

It would be too expensive to have clear water running through indoor swimming pools continuously, and yet the water must be kept clean. Usually it is pumped out of the tank and purified by means of a sand filter, chlorine gas, or ozone, and then allowed to flow back into the tank. At indoor pools there are usually rules which require the bather to take a cleansing bath with soap and water before swimming. Each individual should look upon this as his share of responsibility in helping to keep the pool clean. Bathing suits and towels which are supplied to bathers are thoroughly clean and properly disinfected.

Housing. — Can you think of any one thing which is more important to the health and happiness of an



ATTRACTIVE HOUSING

individual than the right kind of home? Some members of the family spend more time in the home than others, but every one spends more time at home than anywhere else. Of course, the home is more than merely a house in which to live. The love and life of the family are the most important elements of the home. A poor cottage may be a happy home, while a costly mansion may shelter an unhappy family. The cost of the house does not determine the amount of happiness, but it is true that a house which is comfortable, cozy, attractive, and healthful will add to the well-being of the family.

If you were going to select a house in which to live, what are the things you would look for? You would want all of the rooms to be light and airy. The house should be heated so that it would be comfortable in cold weather. You would insist upon a supply of safe drinking water, a sanitary toilet, a convenient place for laundering, and a well-appointed kitchen. The plumbing should be in good condition, and the house should be free from cockroaches, bugs, rats, and mice. It should have proper exits in case of fire.

What does a city government have to do about housing? One would think that the people who were going to live in a house would demand proper sanitation. Most people who build their own houses, or who pay fairly large rent, do insist upon sanitary conditions. There are people, however, who have not yet learned the value of good air, sunlight, and sanitation. Some people have so little money that they are likely to take the least



Courtesy of the American Child Health Association

LESS DESIRABLE HOUSING

expensive rent without considering its dangers, although the cheapest rent will not be the cheapest in the end if it causes sickness in the family.

It is important for the city to make rules and regulations governing the construction of houses, so that there will be no dark rooms without ventilation and so that the plumbing and other sanitary fixtures of the house will be satisfactory. If it were not for such rules, enforced by visits of inspectors, in every large city there would be people living in places entirely unfit for human habitation.

Other health problems. — Other activities of the city which have to do with the comfort, health, and safety of the people include the cleaning and proper lighting of streets. In some cities it may be necessary to prevent an excessive amount of dust or smoke. It is possible that sometime steps will be taken to reduce the amount of noise. Perhaps you can think of some other health problems which relate to city housekeeping.

QUESTIONS, PROBLEMS, AND PROJECTS

1. Is your house protected against the entrance of rats and mice?
2. What can one do to get rid of rats and mice about a house?
3. Inspect your community for fly-breeding places.
4. What is done in your city to fight mosquitoes?
5. Inspect your community for mosquito-breeding places.
6. Can you find out what is done to protect places where you swim?
7. Why is it important for every one to take a soap and water bath before going into a swimming pool?
8. Secure from your city Health Department the regulations governing housing.

IX

KEEPING PEOPLE WELL

What ideas have been held in the past as to the nature of disease?

Is the average length of life increasing or decreasing?

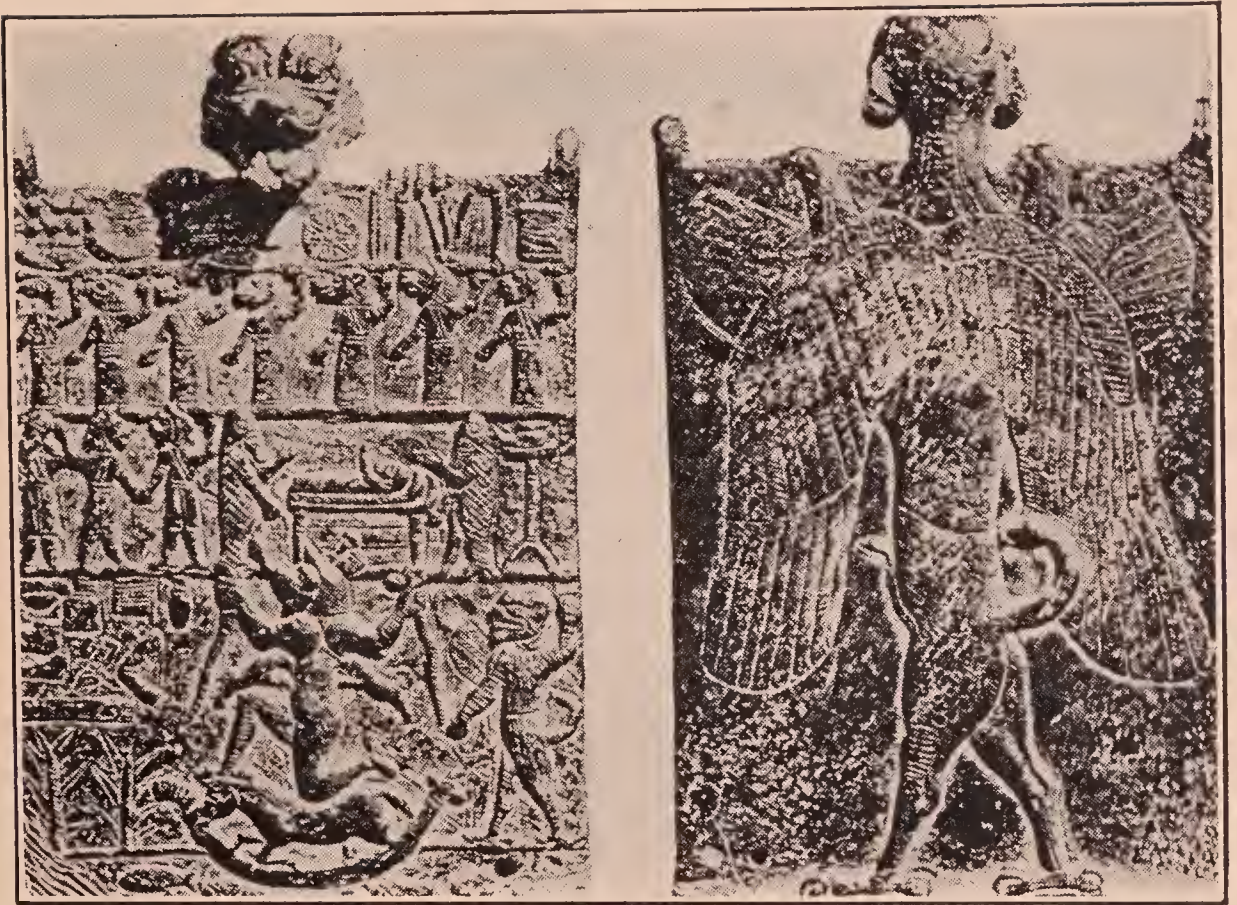
What are the weapons in the warfare against disease?

Why is it that a person who has had a certain communicable disease will not catch it again?

What is immunization?

Have you ever wondered what the people of different nations have done at various times in history in their attempts to keep well? Health, of course, has always been one of the most prized possessions of man. Perhaps some of you are already familiar with customs in other parts of the world which were, or still are, different from our own. Keeping people well has been undertaken in a scientific way for only a few generations. Modern public health work has been developed, for the most part, since the time of Louis Pasteur.

Early ideas of disease. — The records of primitive peoples show that they believed all kinds of diseases to be due to evil spirits or demons. Even today the uncivilized tribes in Africa try to keep themselves well and to cure their diseases by the spells and magic of witch doctors. The medicine man of the American Indians used magic to cure diseases, to bring rain for the harvest, and to protect the members of his tribe from injury.



PRIMITIVE PEOPLE BELIEVED DEMONS TO BE
THE CAUSE OF DISEASE

From the time of the Egyptians, the Persians, the Greeks, the Romans, through the history of the different peoples of Europe during the Middle Ages, charms, spells, magic words, and talismans were used to keep people well and to cure disease. The Greeks sought the aid of special gods and goddesses. Æsculapius was the god of medicine; his daughter, Hygeia, was the goddess of health; and her sister, Panacea, was called the All-Healer. Although the Greeks prayed to these heathen deities, they also used magic spells and verses, for in those days the art of healing was so much mixed up with both magic and religion that the three things

could not be separated. Our own ancestors, not many generations ago, thought of magic as one of the chief ways of keeping people well.

Even seventy-five years ago there were many mistaken ideas about the nature of disease which made it impossible to prevent diseases as we do today. Malaria was believed to be due to bad air, until scientific research showed that it is produced by the bite of the malarial mosquito. Diphtheria and typhoid fever were wrongly thought to be caused by disagreeable odors. Until the microscope was perfected, there was no way by which man could find the tiny parasites which cause the communicable diseases.

Scientific knowledge of disease. — During the last three generations the prevention and cure of disease have become a science. We now know that there are two kinds of diseases. Communicable diseases make up the first group, and they are caused by living parasites which get into the body. The second group of diseases is made up of those which occur when something goes wrong in the body mechanism itself. Public health and personal hygiene help us to *prevent* all these diseases, and modern scientific medicine helps us to cure them. Our knowledge of the true causes of disease has removed much of the fear, anxiety, and worry which our ancestors felt. We know how to live in order to keep well.

Every animal has its natural enemies. The owl is an enemy of the rabbit, the cat is an enemy of rats, the

wolf is an enemy of cattle. We know from a study of natural history that wild animals may attack man, but in this day of cities they rarely get a chance to do so. Even the people who live in the great woods do not fear them, because, knowing the habits of an animal, they know how to protect themselves. So it is with a few tiny plants and animals (parasites) which are our enemies. We have now learned to wage successful war against them. The scientist is the general in this war. He knows the nature of the enemy and how the enemy attacks. He beats his foe at every turn. Epidemics (from the Greek words *epi*, meaning "upon," and *demos*, meaning "people") are becoming more and more rare. Science will ultimately free us from many of our present-day diseases.

The average length of human life is rapidly increasing. A minister named Edward Wigglesworth studied the length of life in New Hampshire and Massachusetts in 1789 and made a table which showed the expected length of life to be just a little over twenty-eight years.* Another table, made in 1855, showed the expected length of life in the state of Massachusetts to be almost forty years. At the present time the expected length of life in the United States has increased to over fifty-six years. You may wish to reckon the percentage of increase in the length of life between these periods, or to make a graph showing how the length of life has

* RAVENEL: *A Half-Century in Public Health*. American Public Health Association.

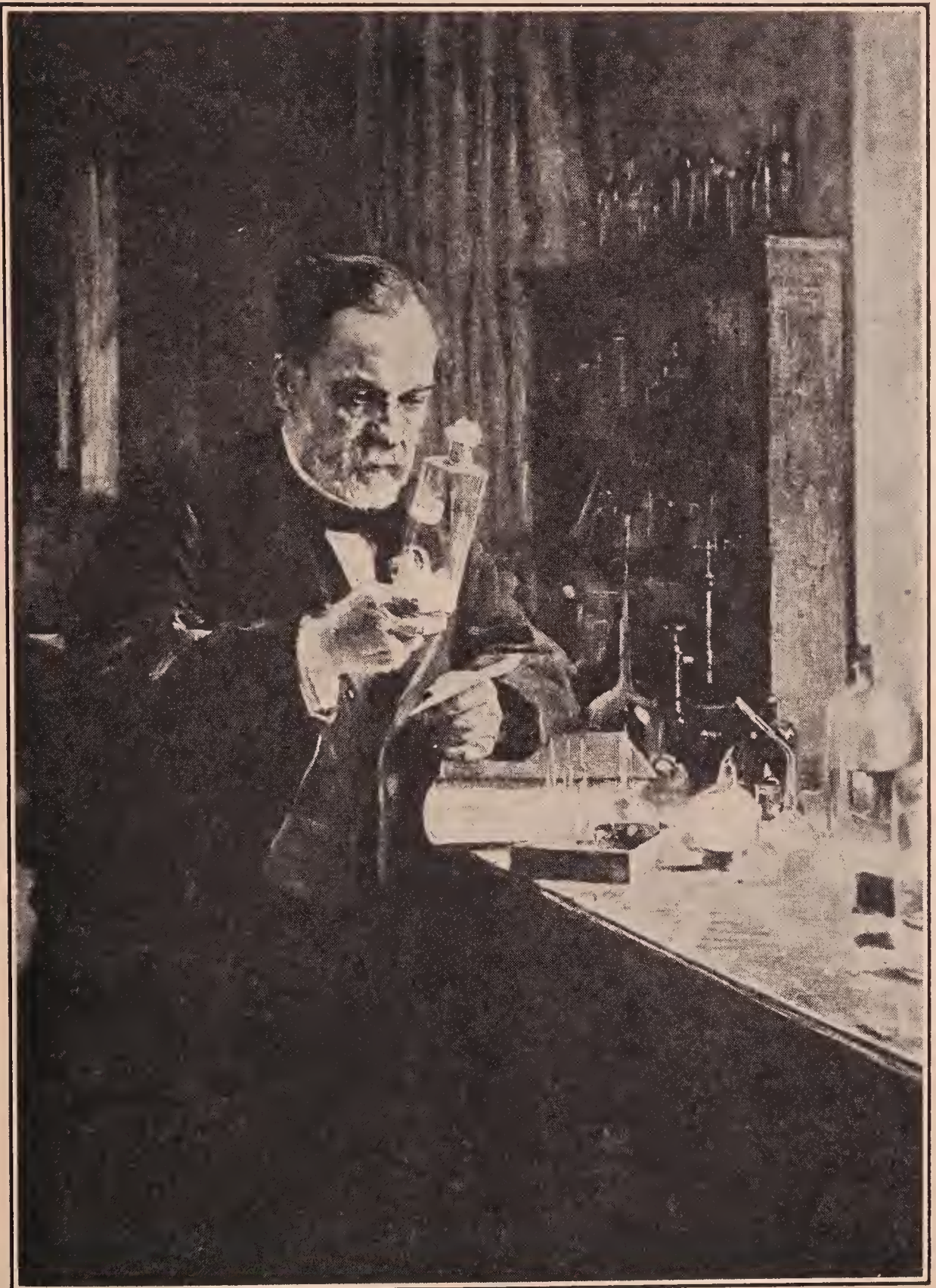
increased. Longer average life has come in part through conquering the communicable diseases. Jenner conquered smallpox by the discovery of vaccination. Pasteur, Walter Reed, Behring, Trudeau, and other health heroes have added to life and health by their scientific discoveries.

Today there are three important factors in keeping people well: (1) we practice health habits; (2) capable, scientific doctors give us regular physical examinations, health advice, and treatment; (3) the health department under the government maintains healthful living conditions.

Imagine that you are the health officer of a city. The health of the people is in your hands, much as the health of soldiers is in the hands of the commanding officers. What could you do to keep people well? Probably you would look first for those enemies against which we have special weapons; you would attack the diseases which we know how to stamp out.

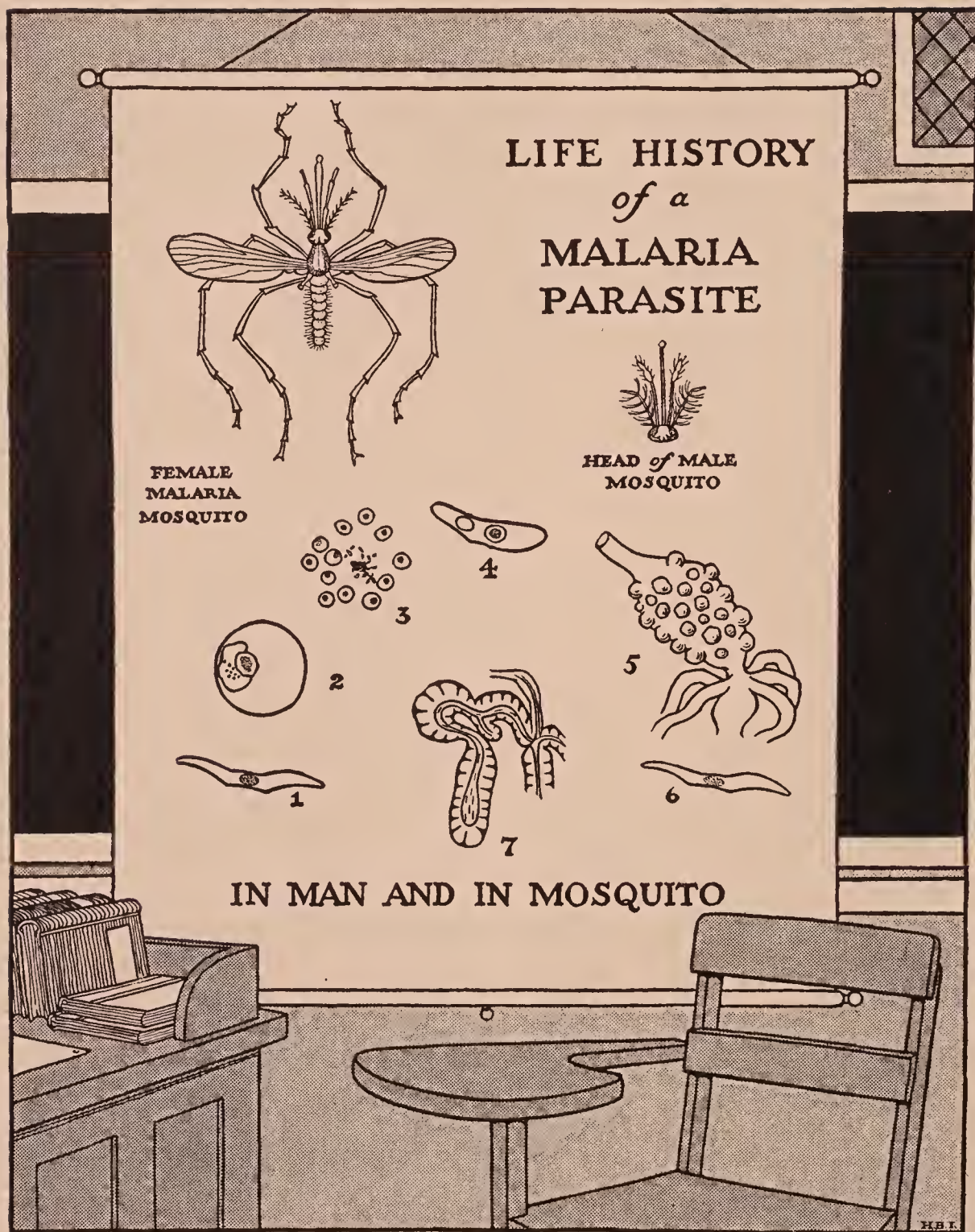
Insect control. — One of the things to be undertaken, especially if you are in the South, would be mosquito control, because this would eliminate two diseases, malaria and yellow fever. Malaria cannot be spread unless (1) some one has malaria; (2) an *Anopheles* mosquito has a chance to stab the malaria patient; and (3) several days later the same mosquito has a chance to stab a well person.

The life history of the malaria parasite is pictured in the illustration on page 114. The chart shows:



LOUIS PASTEUR

Father of the Modern Science of Disease Prevention



(1) a highly magnified malaria parasite in the form in which it goes into the blood from the mosquito; (2) a red blood corpuscle, highly magnified, in which the malaria parasite is living; (3) a group of young parasites

which have been produced in the blood; (4) a form of the parasite in the stomach of the mosquito; (5) picture of the stomach of the mosquito showing the little swellings caused by the growth of the malaria parasite; (6) a single parasite as it comes from the stomach of the mosquito and makes its way to the mosquito's salivary gland; (7) picture of the salivary gland of the mosquito. From the salivary gland the parasite goes to the mouth of the mosquito.

In combating malaria we use a substance (quinine) which kills the malaria parasite in the blood. If a person has to go to a section of the country where malaria is present he can protect himself by taking quinine regularly. If he fails to protect himself he can be cured by quinine, although the cure is more difficult and unpleasant than prevention. Is it not wonderful that quinine, prepared from the bark of a tree, should contain such protecting and curative powers?

If you were a health officer would you try to get rid of house flies as well as mosquitoes? What reasons are there for doing so? How would you go about it?

Immunization. — There are other means of protecting people from particular diseases. You know that people do not usually have measles more than once. This is true for many other diseases. We say that a person who cannot catch a disease is *immune* to it. Do you know of any way by which a person can become immune to disease without having had the disease itself? "Yes," some one will say, "it is possible to be protected against

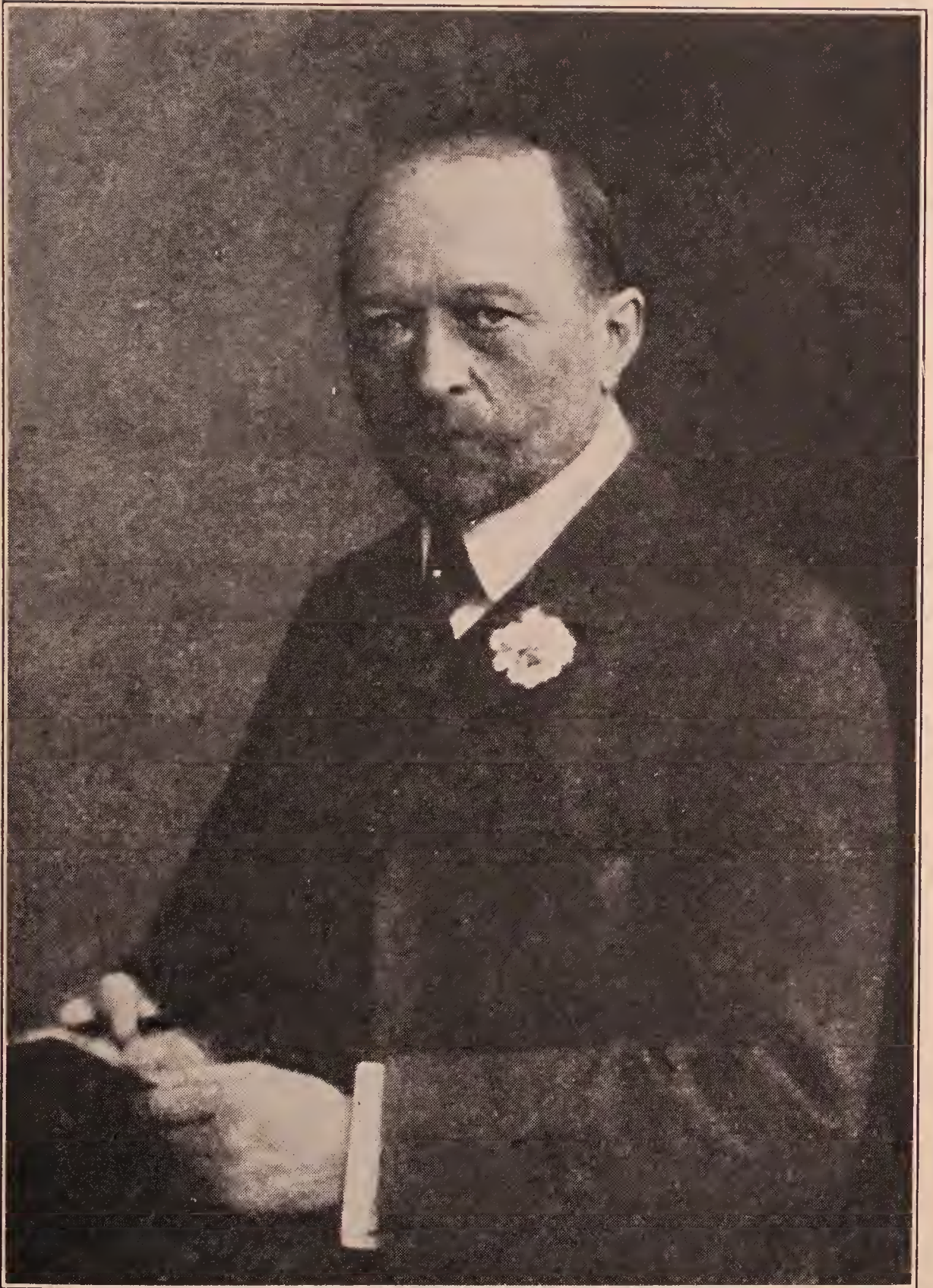
smallpox, diphtheria, and typhoid fever by immunization."

How is immunity produced? When germs get into the body and cause disease, there is a battle between the germs and the body. The germs produce substances which injure the body, and the body produces substances which kill the germs. If the body produces enough of the right kind of substance the germs are killed, and some of this protecting substance stays in the body.

All immunization is based upon this principle. In vaccination and other forms of immunization, weakened or killed germs are introduced into the skin. They cause only slight discomfort, but the body produces the desired protecting substances.

Let us illustrate this principle by using diphtheria as an example. The diphtheria germ produces toxin and the body produces antitoxin. The antitoxin is found in the clear fluid (serum) of the blood. The antitoxin which the doctor uses in curing diphtheria is made in the blood of the horse.

Immunizing the public. — Perhaps you wonder why vaccination and other forms of immunization are problems of community health. You may think that each person should have himself protected, and that the government should not need to do anything about it. There are several reasons, however, why the Health Department urges immunization. Can you think of some of them? For one thing, people are careless, and unless some one reminds them of the need of protection



Courtesy of Metropolitan Life Insurance Company

EMIL VON BEHRING (1854-1917)

Discoverer of Diphtheria Antitoxin

they forget it or put it off until they actually have the disease. Moreover, many people do not understand immunization and, left to themselves, they would never think of having it done. Sometimes people who have never taken the trouble to learn the real truth about immunization advise others against it. Such advice carries great responsibility, does it not? If a person refused immunization because of your wrong advice and later caught the disease and died from it, how would you feel about it?

There are two diseases which we could wipe out entirely by means of immunization. These are smallpox and diphtheria. There is protection against certain other diseases, but these two could and should be driven from the face of the earth.

Smallpox control. — If every little child were properly vaccinated against smallpox the disease would disappear. Doctors recommend that children should be vaccinated before they go to school, and that the vaccination should be repeated in from seven to ten years. Have you been vaccinated? Do you remember your vaccination? What was it like? Is it now time for you to be vaccinated again?

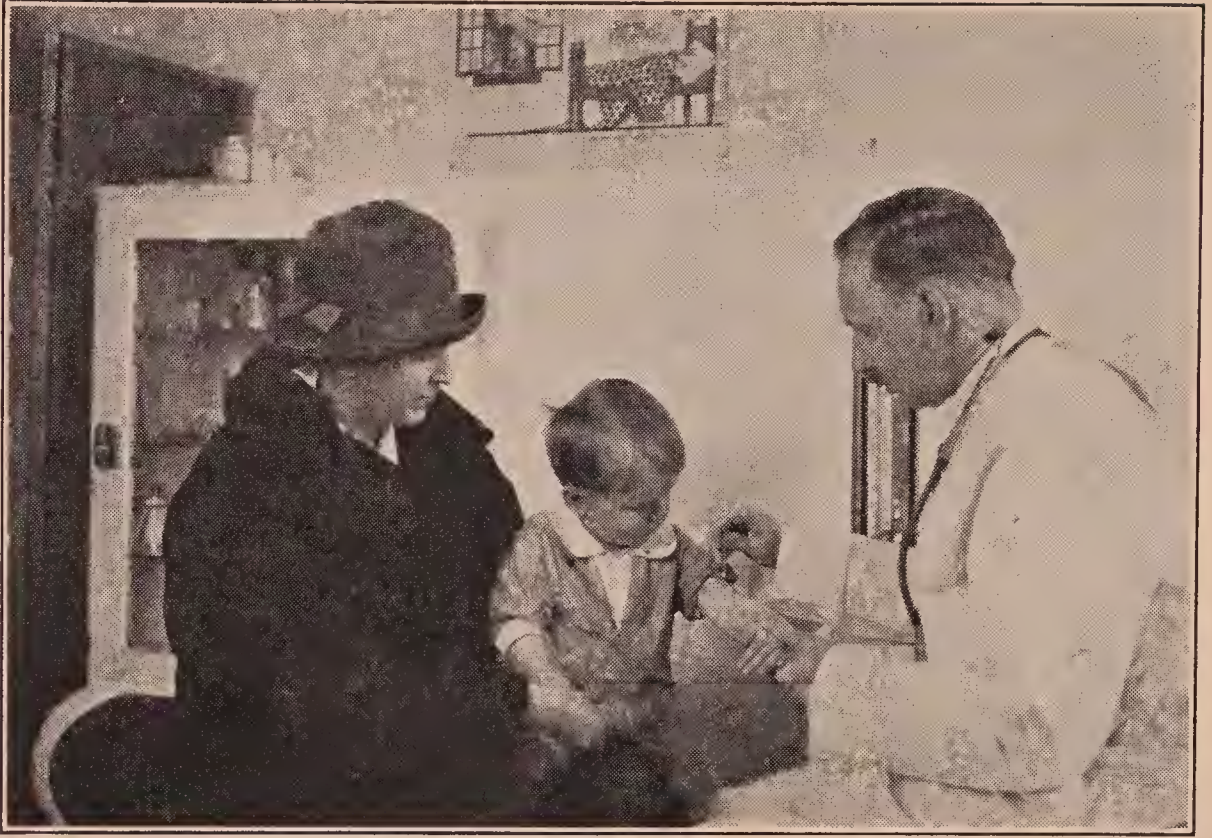
Many states and cities require children to be vaccinated before they are admitted to school. In such places smallpox epidemics do not occur, and there are cases of the disease only when some one brings it in. Where vaccination is not enforced, however, there are sometimes many cases. In one of the great cities of the

United States there were 1508 cases and 140 deaths from smallpox during the first six months of the year 1924. Yet no person who had been successfully vaccinated within the previous five years contracted smallpox. More than 800,000 people were vaccinated in that city to stop the epidemic. The 140 lives would have been saved if the city had kept up compulsory vaccination. It is the duty of every citizen to learn the facts regarding vaccination and to see that the right laws are kept in force.

Diphtheria control. — The following story illustrates how diphtheria may be controlled. Mary Brown was ten years old. She came into the house one day and told her mother that she did not feel well. Her throat was sore; it hurt. What should be done? Her mother noticed that Mary's flesh was hot and that the inside of her throat was red and swollen. She sent immediately for the family doctor. He said that it looked as though Mary was coming down with diphtheria, and that it was advisable to give antitoxin right away.

"Antitoxin does not hurt a person, anyhow," he said to Mary's mother, "and if the disease proves to be diphtheria, antitoxin is a sure cure, provided it is given early enough."

The doctor wanted to make certain whether it was actually diphtheria, so he took bacterial cultures from Mary's nose and throat and sent them to the Health Department laboratory. The bacteria in the cultures were allowed to grow overnight. In the morning the labora-



Courtesy of Milbank Memorial Fund

LITTLE CHILDREN SHOULD BE VACCINATED AGAINST SMALLPOX
AND IMMUNIZED AGAINST DIPHTHERIA

tory worker examined the bacteria under the microscope and found diphtheria germs present.

The doctor was now sure that Mary had diphtheria. He knew just what to do for Mary, and he protected the other members of the family so that they would not catch the disease. Mary was not very sick, because she had received antitoxin early. Her father and mother had only one regret. They realized that they could have had her immunized so that she would never have caught diphtheria at all.*

* This story is told in a moving picture entitled *Conquering Diphtheria*, prepared by the authors for the Society for Visual Education, 327 South LaSalle Street, Chicago, Illinois. You may be able to borrow it from your State Department of Health.

It is important to have children immunized against diphtheria when they are very young. When parents have all babies immunized soon after they are nine months old, there will be no more cases of diphtheria. Several cities in the United States have already immunized most of the children. Some of these cities have not had a case of diphtheria for several years.

Protection against other diseases. — There are other diseases for which immunization has been developed. One may be protected against typhoid fever by vaccination. This disease can be nearly eliminated by proper sanitation, as you have learned in previous chapters. If, however, you are going into the woods or into the country where the sanitary control is poor, it is particularly important that you should be vaccinated against typhoid fever.

Scarlet fever is a disease for which we have control methods similar to those used for diphtheria. Scientists are constantly at work in the attempt to discover a method of immunizing people against other diseases.

State and local Health Departments provide vaccines and immunizing substances for physicians and help physicians by making laboratory tests.

Quarantine and isolation. — Health Departments also protect people through quarantine and isolation. When a person has been exposed to a communicable disease he may be quarantined. The word “quarantine” comes from the Italian word meaning “forty,” and refers to the fact that the ships of long ago were kept in

the harbor for forty days before any of their passengers were allowed to land, whenever there had been cases of communicable disease on board during the voyage. We quarantine a person who has been exposed to a communicable disease by keeping him away from other people.

Isolation means keeping by one's self. When a person actually has a communicable disease every one except the nurse is kept away from the sick room. The good citizen respects the rules of quarantine and isolation, and keeps away from houses in which there is communicable disease.

It is necessary for the Health Department to keep a careful watch over communicable disease. Whenever a case occurs it must be reported to the Health Department at once. The patient is isolated and the people who have already been exposed are quarantined, unless they are immune to the disease.

Sanitation. — What have you learned about the value of sanitation in the prevention of communicable disease? You have seen in the study of water, milk, and foods that sanitation is an important weapon which the city uses to protect the health of its citizens. From your study you could make a list of the ways in which sanitation may be used in the battle of science against disease.

Education in health. — Another way of helping people to keep well is to show them how to do it. Every one should know that red eyes, flushed face, running nose, and



DO YOU RESPECT THE RULES OF ISOLATION?

a cough are the early symptoms of many catching diseases. A person who is well nourished and free from fatigue, who gets sunlight and fresh air, and who is in general good health, is not likely to catch cold or to have tuberculosis. If Health Departments can explain such things to people and help them to follow the rules of health, diseases will be less common.

Moreover, people get sick from many diseases which

are not catching at all. There are disorders of the digestive tract, the kidneys, or the liver. There are various troubles caused by improper posture and the wrong use of the body. Nervous disorders develop because people overwork and fail to have enough rest and wholesome recreation. The body is like an automobile; it must have reasonable attention or some part goes wrong. A new part cannot be substituted in the human body as it can in an automobile.

The annual physical examination is an important aid in keeping well. Such an examination enables a person to find out from the doctor whether he is perfectly sound. If a defect starts to develop, it may be discovered and corrected before it becomes serious.

REVIEW QUESTIONS

1. Now answer the questions at the beginning of the chapter.
2. How do the present methods of keeping people well differ from those of a few hundred years ago?
3. What is the health value of insect control?
4. What is meant by toxin? Antitoxin? Epidemic? Quarantine? Isolation? Sanitation?
5. What diseases could be completely wiped out? How?
6. What are the responsibilities of a citizen in the control of communicable disease?
7. Should he report a case which has not been reported to the Health Department?
8. What is his part in helping to maintain isolation?
9. What danger is there in being near people who have red eyes, running nose, a flushed face, or a cough?
10. Why is it important to obey quarantine and isolation rules and make other people obey them?

PROBLEMS AND PROJECTS

1. Perhaps you would like to discuss the relative value of the following weapons for fighting disease:
 1. Insect control
 2. Quarantine
 3. Isolation
 4. Immunization
 5. Sanitation
 6. Education
2. You might like to learn more of the conquest of disease by studying the lives of such health heroes as Louis Pasteur, Edward Jenner, and Walter Reed.
3. Secure from your local Health Department the rules for disease control and discuss them in class.
4. Motion pictures on the prevention of diphtheria, smallpox, or other diseases may be secured through your State Department of Health.

X

VENTILATION

What is good ventilation?

What is meant by window ventilation?

What is meant by mechanical ventilation?

What are the effects of air upon the body?

What is the relation of sunlight to health?

Most animals except man live out of doors. Man lives in heated houses. A few centuries ago most men worked out of doors, but now a majority of them work in stores, factories, shops, or other buildings. The Indian boy spent his days out of doors. You spend your days in the schoolhouse. Because we live in buildings which keep the wind from blowing upon us, we need to *ventilate* our rooms. Ventilation comes from the Latin word *ventus*, meaning "wind." It is the process of getting fresh air into buildings.

You have learned from your earlier studies of health something about the way in which the body keeps the same temperature. The human body remains at 98.6° F. in the Arctic circle or in the tropics. You yourself have experienced the discomfort of being too cold and the discomfort of being too warm, and yet under extreme conditions of heat and cold the healthy body does not change temperature very much in either direction. Good ventilation provides air which has a stimulating



FRESH AIR IS INVIGORATING

effect upon the skin and allows the body to keep the proper temperature without too much effort.

Have you not enjoyed the presence of fresh air and suffered from its lack? How invigorating it is to walk or play out of doors! How wide-awake you feel in winter when the cold out-of-door air strikes your skin and puts color into your cheeks as you hike or slide or skate! How dull, lifeless, and sleepy you feel when you have

been sitting in a hot room for a long time! In the summer, when the weather has been hot and sticky, how much better you feel if a breeze comes up!

It is easy to understand the cooling effect of the air as it comes in contact with the skin. The more rapidly the air is moving and the cooler it is, the more the body is cooled by it. When the air becomes too cold we get behind a shelter, out of the wind, or we go indoors; we build a fire or we put on more clothes. In summer, when it is warm, we go out of doors; we try to find a place where there is a breeze; we wear lighter clothes; we fan ourselves; we perspire.

The process of perspiring is more important than the other factors in keeping cool. It is nature's method of cooling off the body. When we perspire, water comes from the sweat glands and the skin is wet with the perspiration which stands in little drops. It is turned into vapor and passes off into the air. That process is called evaporation, and it uses up heat from the body.

If you want a simple illustration of the cooling process of evaporation, put a drop of ether or a drop of alcohol on the back of your hand. You will notice that it feels cool. This is because ether and alcohol evaporate rapidly. If you put just a bit of water on your hand and fan it vigorously you will notice that the spot where the water is feels cooler than the rest of the hand. Perspiring, with the evaporation which follows, is the most important method of cooling the body when it is hot.

Effects of poor ventilation. — Let us see what happens when the body is unable to cool itself. The following story tells the famous incident of “The Black Hole of Calcutta.”

In the year 1756, Fort William in Calcutta, India, was captured by the ruler of the Province of Bengal. The soldiers who were still in the fort when it surrendered were driven into the guard room. There were 146 men, who were pushed into a room about twenty feet square, having only two small windows barred with iron. If you mark off a square on the floor which is eighteen inches on each side, you will have about the amount of space that each man had to stand upon.

Very soon after they were put into the room they began to perspire. They suffered severely. They became wretched. They threw insults at the guards, hoping to make them angry so that the guards would shoot them and end their misery. At six o'clock in the morning an order came for their release. Only twenty-three of the 146 men were still alive, and they were so weak they could hardly move. Most of the twenty-three survivors suffered from fever.

The men who died were killed by heat stroke. There was no way for fresh air to get to their bodies and cool them off by taking away the heat which the body is always manufacturing. If the conditions of the “Black Hole of Calcutta” were repeated today, except that a strong electric fan were blowing air down upon the men, probably no one would die.



WHICH BOY IS GIVING HIS SKIN PROPER VENTILATION?

In the study of physiology we learn in more detail how the body loses heat. Studies on ventilation have shown what happens when a person is put in a room where the air is very hot, moist, and still. The person becomes restless and irritable. The heart beats faster. A headache begins. The person becomes thirsty. The eyes get red and sore. There may be a feeling of weight on the chest, and the person may even become dizzy. After coming out of such a hot chamber the person feels tired and “fagged out.”

Such studies show that a person following his own inclination is likely to do less work, either physical or mental, in a warm room than in a cool one. He gets tired quickly in a warm room and does not feel well. On the other hand, if he is in cool air he feels like working; the body produces more heat and uses up the food which he has eaten. His appetite is better; his circulation and breathing are improved.

It appears also that a person's resistance to common cold is greater if he lives in properly ventilated rooms than if he lives in overheated rooms. Studies by the New York Ventilating Commission, which were conducted with sixty-five hundred school children in the city of New York for a period of two or three months in two succeeding winters, show that the children in properly ventilated rooms had 18 per cent less absences through colds and 70 per cent less colds than the pupils in rooms which were too hot and poorly ventilated. These facts show the importance of having fresh air continuously.

The air in which we live indoors should be slightly changing, like the out-of-door air. If it is exactly the same, hour after hour, in its temperature, its rate of movement, and the amount of moisture it contains, there is little stimulating effect. If it is slightly changing, the skin will continually react to these changes, and the body will feel better for these reactions.

What is fresh indoor air? The air in good ventilation has the following five qualities: (1) moderate temperature; (2) gentle motion; (3) a moderate amount of moisture; (4) a slightly varying temperature; (5) freedom from dust and odors.

It is not safe to rely upon comfort alone in deciding what is good air. A person may easily acquire a taste for something which is not good for him. After you have just eaten candy, you have no taste for milk or vegetables, although you know that they are better foods than

candy. In the same way people often get used to rooms which are much too hot. The skin loses its vigor and the body does not adjust itself readily to the cooler temperatures which are much more healthful.

Types of ventilation. — Since ventilation is so important to health the problem of getting fresh air into our homes, schoolhouses, factories, and public buildings is an important problem in community health. Let us see what is necessary in order to have fresh air in our homes and schools.

There are two widely different methods of ventilating. One is by window ventilation, and the other is by mechanical ventilation. There are many modifications of these two principal methods. The engineering details of ventilation cannot be studied in this class; but it is possible for us to learn something of general principles.

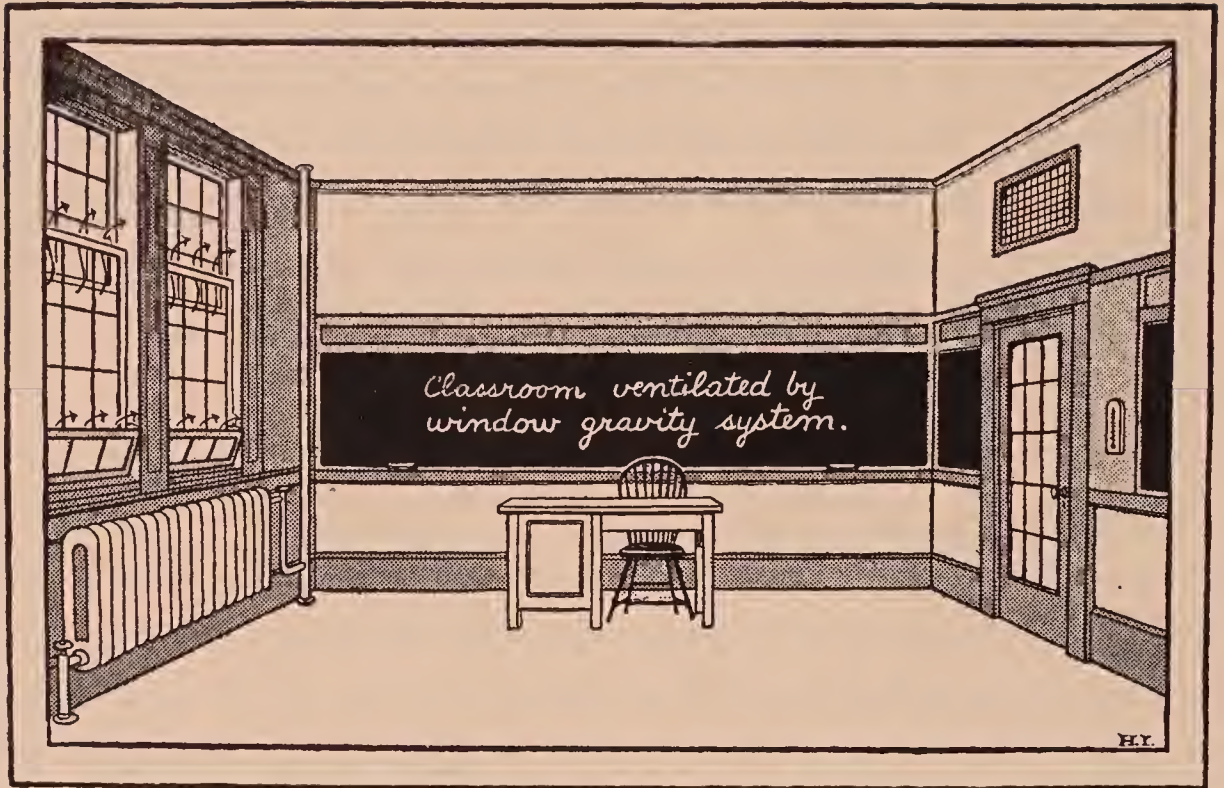
Window ventilation. — There is some disagreement still concerning the best way to ventilate rooms, but studies on ventilation in both the United States and England seem to favor window ventilation. In this type of ventilation the room is heated by radiators, and the cool outside air enters continuously through open windows. This is the system which is most commonly used in homes. In summer the windows are wide open. In winter, when the air outside is very cold, one can feel the cool air coming in around the closed windows. In fact, so much air enters in this way that it may not be necessary to raise the window more than a crack in order to get plenty of fresh air.

In straight window ventilation the fresh air comes in at the bottom of the window and the warm air goes out at the top. You have all been taught to open the window at top and bottom when you go to bed at night. This secures the best circulation of air. We cannot open the windows wide at top and bottom in our living rooms in the winter because it would be too cold. It is not very difficult to ventilate a house, because there are usually windows on two sides of the room, and there are many doors. Air enters through the walls and around the windows, so that a large amount of fresh air finds its way into the house in cold weather.

There are some disadvantages to straight window ventilation in large rooms. The air may not circulate sufficiently if only one window is used. If two windows on opposite sides of the room are open, there may be a draft, and usually the floors are cold.

In the schoolroom with windows on only one side, these difficulties from window ventilation are increased. It is now usually recommended that window ventilation in schoolrooms be improved by adding ducts or pipes which run from the room to the roof to carry off the hot air.

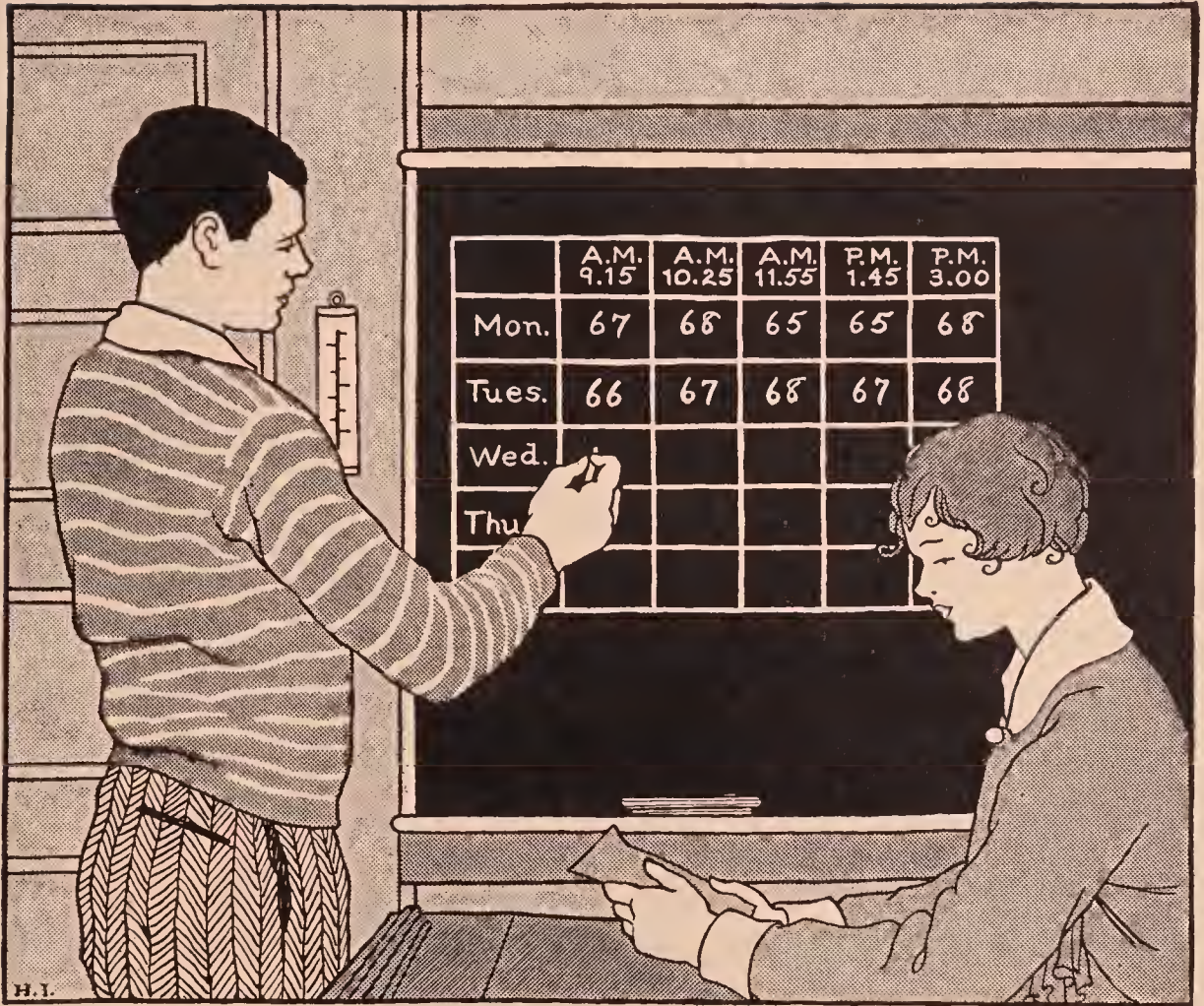
Beneath the windows there are radiators which furnish heat. As the cool air comes in where the window is raised at the bottom, there is a window board which starts the air up toward the ceiling. If it were not for this window board the cold air, which is heavier than warm air, would slide over the window sill and drop



directly to the floor. With the arrangement shown in the picture the cold air is obliged to climb over the top of the window board, where it meets the warm air which is coming up from the radiators. Such a process keeps the air in the room in motion and provides a constant supply of fresh air.

The warmest air in the room will always be found nearest the ceiling, and it is near the ceiling that we find the vent opening into the pipes which go to the roof. The warm air goes out through these pipes, allowing the continual supply of fresh air to come in through the windows.

This kind of ventilation can be controlled within the classroom. In many rooms the steam in the radiators can be turned on and off, and it is always possible to



CONTROL THE TEMPERATURE IN YOUR CLASSROOM

raise or lower windows. On very cold days the windows will need to be open only the least crack. On warmer days the windows will be open wide.

Of course a room will not adjust itself as the weather changes. Every room needs attention to keep it from getting too hot at times and too cold at others. The best plan is to have some pupil directly responsible for the ventilation. A temperature chart can be kept on the blackboard or on paper beside the thermometer. The pupil will read the thermometer at regular times each day and record the temperature. When the tem-

perature is too high the room will be cooled by opening the windows. The best plan is to keep the room at temperatures of about 65° to 68° F. The temperature may go somewhat lower than this, but it ought not to go higher.

You have no doubt heard of open-air classes for children who are not very strong. They are taught out of doors or in a room where windows are taken out or kept open. People in tuberculosis hospitals, and people sick with some other diseases, are kept in the open air continually. If fresh air will help to cure these people, surely it will help to keep us well.

Mechanical ventilation. — The other type of ventilation is called the mechanical system. In this system the air from out of doors comes in through a heater where it is heated to a temperature of from 70° to 100° F. Fresh air is then mixed with it to give the desired temperature, and the mixed air is sent into the room. This hot air is blown into the rooms by a set of fans which work like electric fans, except that they are inside of pipes and pull the hot air along rapidly. The hot air rises to the ceiling as it enters the room. The cool air from the floor goes into an outlet pipe, which may or may not have a set of fans to pull it along faster.

There are some disadvantages to this kind of ventilation. The air coming into the room is always of the same temperature, and therefore lacks the variation which is found in out-of-door air. The fan-driven air moves more rapidly, and the room must be kept at a

higher temperature for comfort. Because of the different room conditions, as to sunlight and outdoor exposure, it is difficult to distribute the air in a way which keeps all the rooms comfortable.

Sunlight. — We should remember that some of the health value which comes from being out of doors is derived from sunlight. You recall that sunlight will prevent rickets. The body is able to use the energy of the sun in some way for maintaining health and vigor. Exactly what takes place is not known. Scientists tell us that the ultra-violet rays of the sun are the most healthful, and that we lose the benefit of these when the sunlight passes through ordinary window glass. Ultra-violet light will not pass through ordinary glass. Fresh air and sunlight are wonderful gifts of nature for the stimulation of life and the preservation of health.

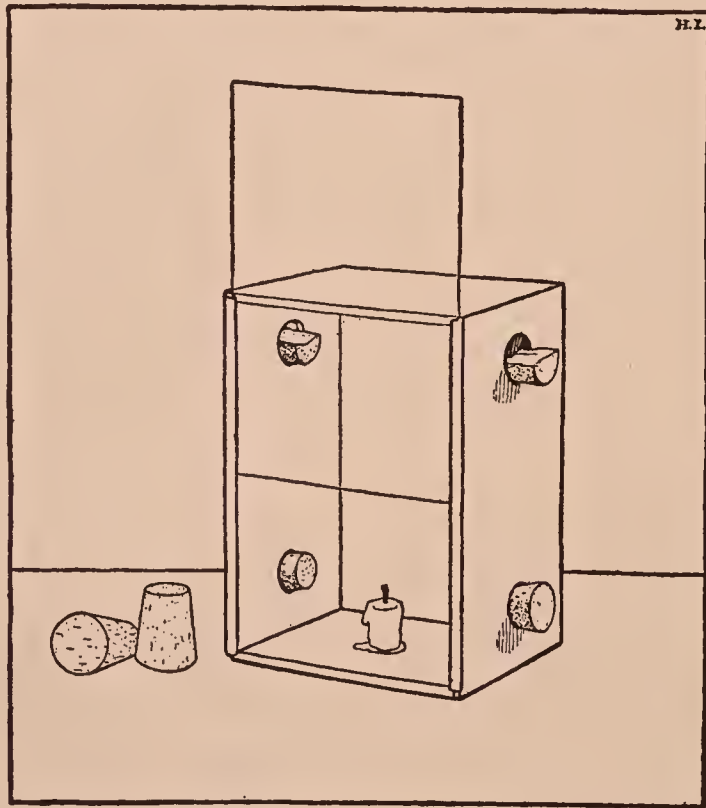
What is your responsibility in regard to air and sunlight?

QUESTIONS AND PROJECTS

1. What does ventilation mean?
2. What are the effects of poor ventilation?
3. What experiences have you had in different kinds of ventilation?
4. Make a chart showing the differences between window ventilation and mechanical ventilation.
5. How is your house ventilated?
6. At what temperature is it kept?
7. Organize the class to keep a record of classroom temperature and adjust ventilation conditions.
8. How is your school building ventilated? Arrange for a trip

to see the school heating plan when the custodian can explain to you how it operates.

9. If some pupils have access to the ventilating system of some other public building, let them report upon it.
10. Perform ventilation experiments, using a chalk box arranged like the one shown in the picture. Use a one-inch candle and see with which combination of openings it burns best. The candle may go out for want of oxygen. The body will always get enough oxygen; but we need fresh air on the skin. Is there any advantage in having a window opened at the top and bottom?



MAKE A BOX LIKE THIS FOR VENTILA-
TION EXPERIMENTS

XI

INFANT WELFARE

Does the care of a baby affect his health in later life?

What are the important rules for the care of babies and little children?

What responsibilities do parents have for the health of the child?

What is the responsibility of the community for the health of little children?

A marked difference between man and the lower animals, in respect to bringing up the young, is the amount of time required. Puppies and kittens are ready to shift for themselves in a few months. Indeed, mother-love usually lasts only through the period when the young animal is dependent upon the mother for food and protection. How different with human beings! Even after ten years of home care a young human is still quite unprepared to take care of himself, although he may manage somehow if he is actually thrown upon his own resources. Man does not reach his complete development until he is twenty-one, and he is usually considered unable to take care of himself until he is at least sixteen years old.

Think for a moment what a child does during this long period of development. He should be brought up in such a way that he comes to manhood with a strong, healthy body. He learns from parents, teachers, friends,



Courtesy of the Metropolitan Life Insurance Co.

THIS BABY HAS HEALTH

and from his own experience, the skills of mind and body which he needs in later life. He grows in intelligence and understanding. Out of his own experience with other people in home, school, and neighborhood, he learns the desirability of honesty, sincerity, loyalty, industry, unselfishness, and all those other qualities of behavior which add to contentment in life. His development must be along

several lines — physical, mental, social, and moral — if it is to be complete. This long period of growth is a preparation for the rest of life, but it is such a happy time for most of us that we think childhood is worth living just for its own sake.

You may be surprised to know that the most rapid period of development is during the earliest years. The rate of growth of a baby is greatest during his first month of life, when his weight increases over 20 per cent. The rate of growth becomes less as he gets older, and during the twelfth month he increases in weight a little less than 3 per cent. It takes only from seven to eight

months for the baby to double its weight. What fraction of your weight did you gain during the past eight months? During the first six years a child doubles his height and increases his weight fourfold.

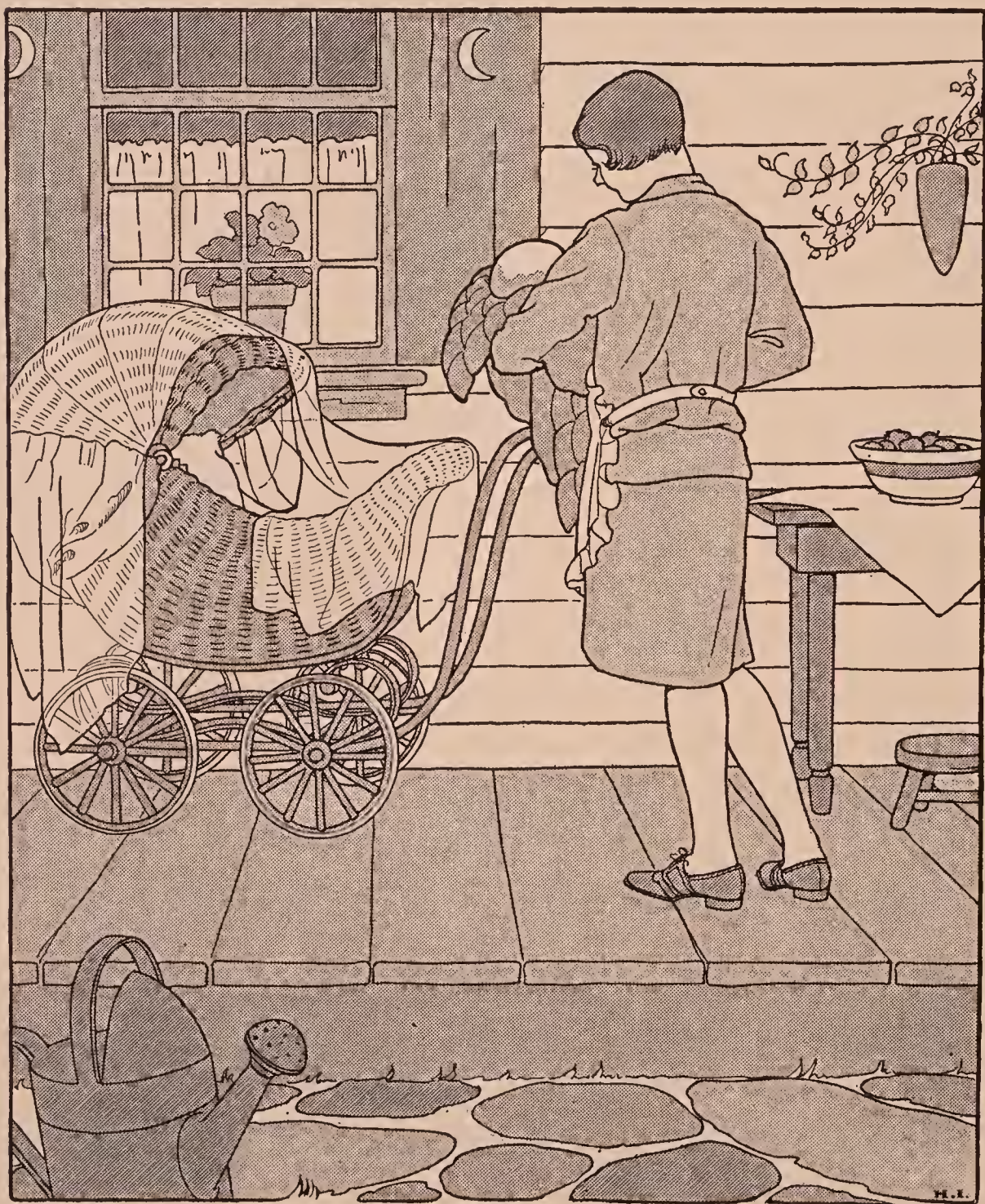
The rate of mental growth is also greatest with the infant, and becomes less as he gets older. Just think what the baby learns in two or three years. He learns to use his eyes and ears, to handle things, to walk, to talk, and to understand others. One of the things which make the baby so interesting is that it changes and develops so rapidly. Almost every day sees some new accomplishment.

In many ways the time of infancy is a critical time in the life of a human being. Indeed, the quality of health in later life is quite dependent upon the care given during this time. The baby is more delicate than the older child. It must be cared for in ways favorable to its health, and it must be protected from disease.

Care of the baby. — Improvement in infant care has come about with increasing knowledge regarding food and its relation to growth. Mothers are urged to nurse their babies if possible. Babies are fed with small quantities of fruit juices or vegetable juices as soon as they are put upon a diet other than mother's milk. The child early cultivates a taste for vegetables and whole-grain cereals.

Our scientific knowledge in regard to the value of sunlight and fresh air also influences the care of babies. We put them to sleep in airy, sunny rooms, or on outdoor porches. We let them stretch and play in the sun

with very little clothing when the weather is warm and there is suitable opportunity. Ordinary window glass, as you know, keeps out the ultra-violet rays of the sun.



THE BABY SLEEPS IN THE FRESH AIR

Direct sunlight, or sunlight through special kinds of glass, aids the growth of the child. Sunlight and proper food prevent rickets, that disease of childhood in which the bones do not develop properly. Cod liver oil is sometimes called "bottled sunlight" because it contains Vitamin D and is, therefore, a means of preventing rickets.

With our present knowledge of bacteria and bacterial cleanliness a new era in baby care began. Everything used in caring for the baby is kept as clean as possible. One reason why the mother nurses the infant during the first few months is that mother's milk is safer than cow's milk. The latter, as you know, must come from some distance and be handled by several people. Mother's milk is also better because its composition is naturally suited to the needs of the baby, whereas cow's milk must be modified. Mother's milk has more sugar but less mineral matter and less protein than cow's milk. It is more easily digested. If the baby must be bottle-fed, the best quality of milk should be used. Under what conditions should milk be produced to be safe for babies?

Perhaps one of the most important items in scientific infant care is the attention given to *routine*. The baby sleeps at certain appointed times, he is fed regularly, he is bathed and dressed in the prescribed way. He is not wakened from sleep to entertain visitors. His food does not vary from that prescribed for him.

The wise mother of today does not feed her child

candy, cake, ice cream, or any food outside the simple diet ordered by the doctor. Babies and young children do not cry for sweets unless they are taught to like them. They are satisfied with simple foods and with a small variety. Children who are brought up carefully on such foods as milk, fruits, vegetables, whole-grain cereals, bread and butter, have the best chance of becoming strong, with hard bones, firm muscles, and beautiful teeth. The child who eats sweets is likely to be fussy about other foods, and as a result he does not have the materials which are needed to build bone, muscle, and teeth.

Dental hygiene. — The diet of the child up to six years of age largely determines the quality of the second teeth, which are being formed deep in the jaws behind the first teeth. Unless the diet of early childhood is rich in milk, leafy vegetables, and whole-grain foods, the body will not secure the calcium and other substances which are needed to build strong teeth. Hard foods, which necessitate vigorous chewing, are also important, because they give exercise to the jaws and help them to develop naturally. Continual thumb-sucking, or the use of a pacifier, is likely to deform the upper jaw so that it causes a homely arrangement of the teeth. Sometimes stiff cardboard cuffs are put around a baby's elbows so that he cannot get his hands up to his mouth. It is well worth while for children's first teeth to receive dental attention. One of the most important services the dentist can ever render is to mend imperfections in

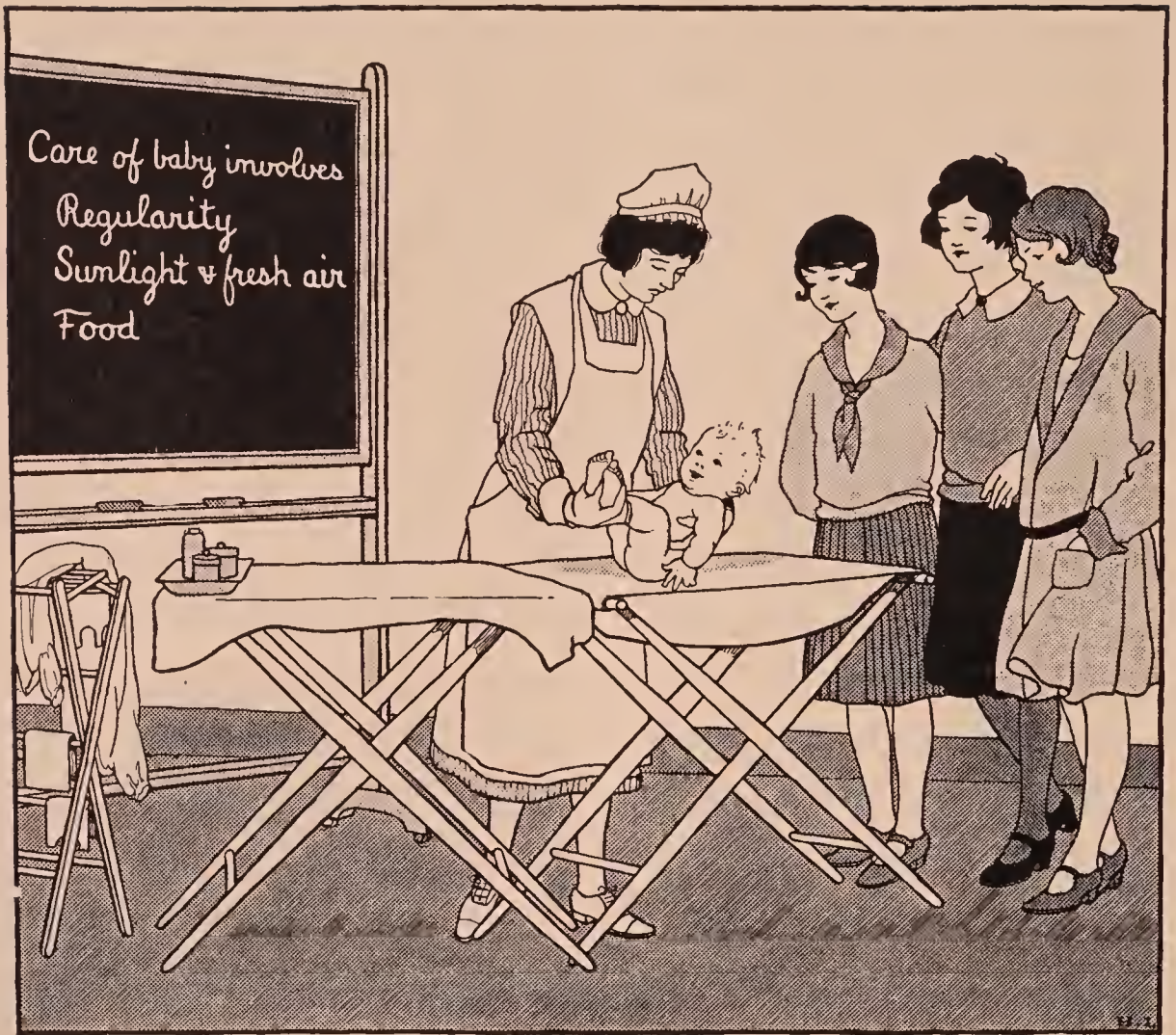
the enamel of teeth as soon as possible after they are cut.

Community responsibility. — Thus far we have considered only the responsibility of individuals in the problem of infant care. The community has responsibilities too.

First of all, it must provide conditions which are conducive to health and growth and which will protect babies from disease. Many of these problems related to healthful conditions for children have been discussed in earlier chapters. What is the relation of milk control to infant welfare? Is a pure water supply important for children? How are housing regulations related to infant health? What do parks and playgrounds contribute to the health of little children? How does communicable-disease control affect the child?

A second duty of the community is to supply information about the proper care of babies and small children. There are many excellent books on this subject, and new information is constantly appearing from doctors and research workers. Sometimes people are puzzled to know which is correct information and which is misinformation. City and State Health Departments offer advice in regard to child care and recommend sources of information which are sound. Seek advice only from such reliable sources as your family physician, your nurse, your Board of Health, or your State Department of Health.

A third way in which the community promotes infant welfare is through actual service to mothers and babies.



HOME HYGIENE CLASSES TEACH THE CARE OF THE BABY

Of course, people who can afford to have their own doctors and nurses prefer to do so, but some people cannot afford such service. If there is a baby clinic in your city you will be interested to find out what service it gives. What nursing service is offered in your community through the Board of Health or through private nursing organizations? How are these services paid for?

You can easily see that it is to the advantage of the community to spend money on infant welfare. The most valuable possession of a community is its children.

They are the coming generation, and in providing for their health and vigor we provide for the future. Furthermore, the time of infancy is the most precious time from the standpoint of health. The quality of the care given during babyhood affects the health of later years. One may get a poor start or a good one. It is our responsibility, both as individuals in the home and as citizens in the community, to give the best possible care to these little tots who look to us for a proper start in life.

QUESTIONS AND PROJECTS

1. What health habits have been brought to your attention in the study of infant care?
2. In what ways can boys and girls of your age aid in the care of younger brothers and sisters?
3. Make a set of health rules for the care of babies, including those which have been mentioned in this chapter and any others upon which the class can agree.
4. Arrange for different groups in the class to study and report upon the community activities for infant and child welfare. It may be desirable for a small committee to visit a baby clinic or the Health Department or some other place where baby-hygiene work is being carried on.
5. Write to your State Health Department for pamphlets on infant and child welfare. Write for similar pamphlets to the Bureau of Education in Washington.

XII

THE HEALTH DEPARTMENT

Who is your Health Officer?

Do you know any one connected with the Health Department?

What things have you known your Health Department to do?

Do you know how the Health Department is organized?

How many duties of the Health Department can you name?

Why is it important for your city to have a good Health Department?

The work of Health Departments in the United States saves literally thousands of lives every year. They make our towns, counties, and cities healthier and happier places in which to live. As young citizens you want to know what to expect from your Health Department, and as you look forward to voting citizenship you want to know what is the citizen's obligation in securing and supporting a good county or city health organization.

Organization. — The Health Department is a branch of the town, county, or city government. The organization is not always the same, but most commonly there are a Board of Health and a Health Officer or Executive Agent. The members of the Board of Health may be elected by the people or appointed by the mayor. Perhaps the best way of securing a good Health Officer is to have him appointed by the Board of Health. Sometimes, however, he is appointed by the mayor or by the town or county officials.

The Board of Health decides the policy of the department, but the task of doing, supervising, and directing the work rests with the Health Officer. He is the administrator or executive officer for the Board. Let us consider what are the powers and duties of a local Health Department.

Powers of the Health Department. — It is an accepted principle of government that nothing shall be allowed to endanger the health of the people if it can be prevented. As you know, the property and the rights of every individual are protected by the law. If a person attempts to do anything which endangers the health of other people the government has the right and the obligation to stop him.

Let us see just what this means. If a man owned a piece of land beside a pond, would he not have the right to use it for any purpose he chose? Yes, unless the way in which he used it caused injury to other people. If the pond were being used as a water supply for the city, he could be prevented from throwing rubbish, dirt, or poisonous substances into the water or along the shore.

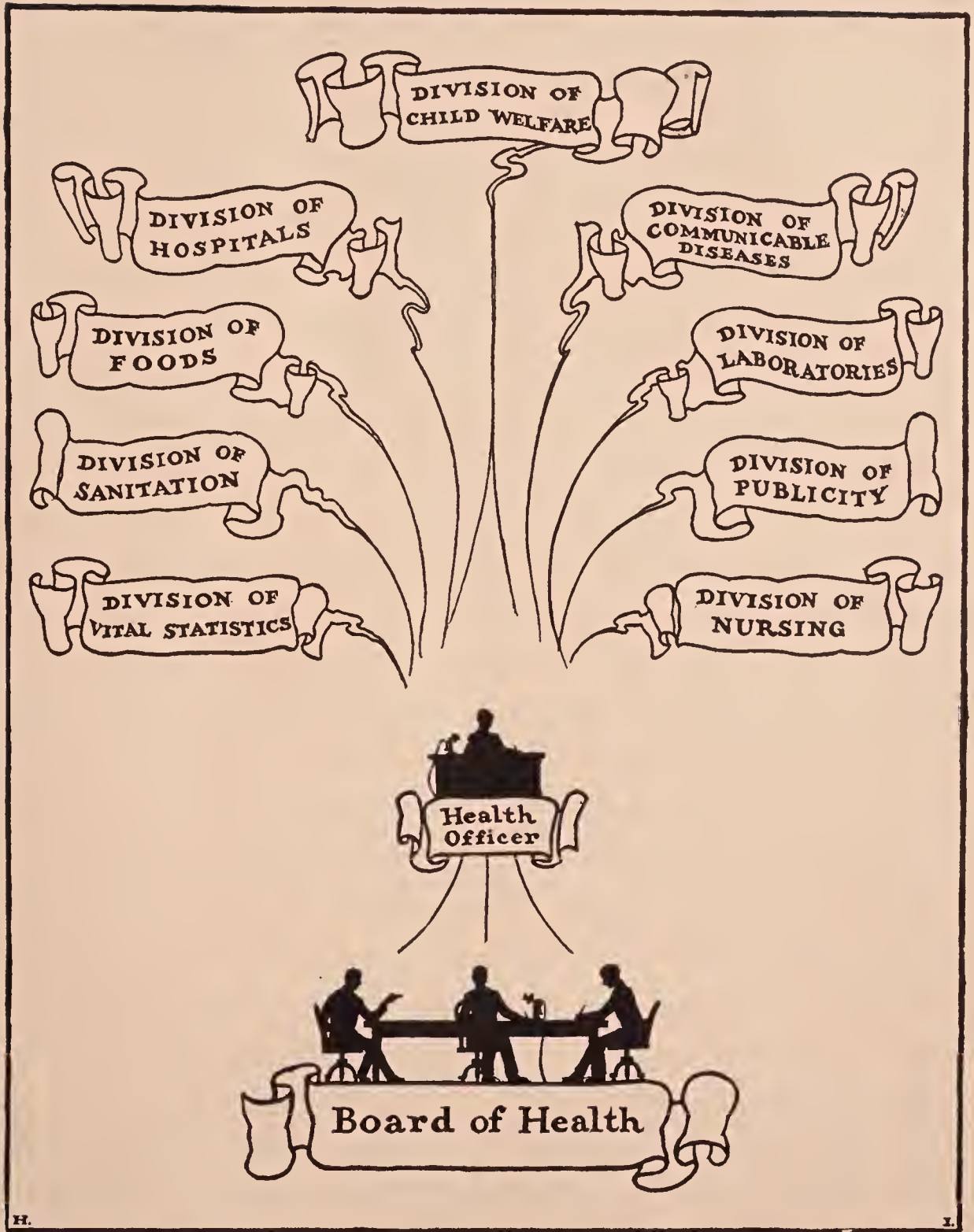
Such a condition injurious to health is called a *nuisance*, and the Health Department would do away with it. A nuisance is anything that interferes with the health and comfort of people. Keeping pigs on a farm is not a nuisance, but keeping pigs in a city is a nuisance *if* disagreeable odors come from the pigpen and annoy the neighbors.

The Health Department has the task of protecting the public from health dangers which may be caused by any person. It also protects the public from health dangers for which no one person is to be blamed. In those sections of the country where malaria is present, for example, proper sanitation demands that swamps shall be drained and that standing water shall be eliminated in order to prevent the breeding of mosquitoes. In some instances the Health Department enforces sanitary rules and regulations; in other instances it acts to protect the health of the public when there are no written regulations.

You have already learned something about the different health activities which are carried on in the community. We shall study in this chapter the organization of the Health Department for carrying out these activities.

The work of Health Departments in different cities may vary somewhat. The organization of a large Health Department will naturally differ from that of a small department. The health activities in your community will be most interesting to you, and you will do well to keep them in mind in your study and discussion of this chapter.

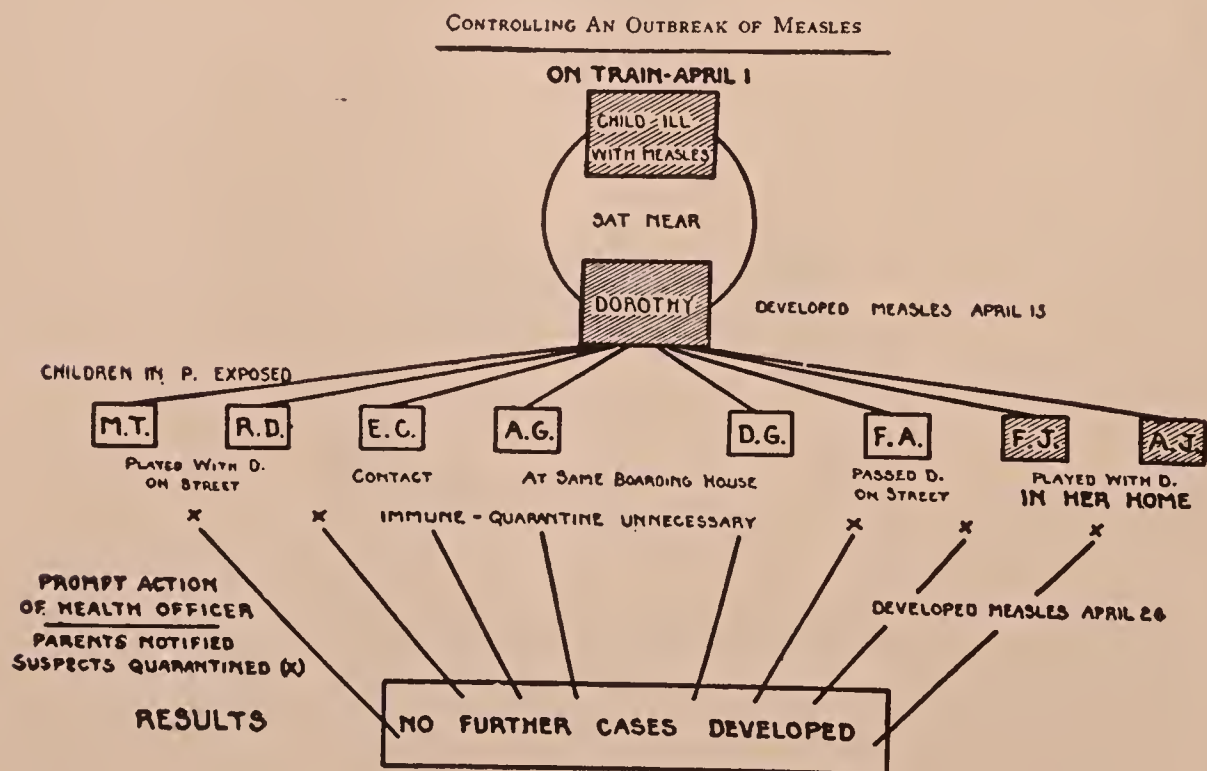
A chart of a typical large city Health Department has been included here in order that you may see the number of its different activities and divisions. It will be simplest for us if we consider at this point the work of each division.



Division of Communicable Diseases. — One of the most important duties of a Health Department is to prevent epidemics. For example, when a case of com-

municable disease appears the Health Department immediately takes every possible step to prevent its spread. The important part of this task is to isolate the person who is ill and to quarantine the people who have been exposed to the disease and may come down with it later. The number of days after exposure before a person becomes ill with any particular disease is known, and quarantine will keep the exposed person away from other people until he comes down with the disease himself or until it is certain that he is not going to have it. The time between the day when a person is exposed to a catching disease and the day when he becomes ill is called the *incubation period*.

The chart shown here illustrates how a Health Department prevented an outbreak of measles. You can



see from the chart just what the Health Department did. First, a card was put up on the house so that other children would not come in to see Dorothy while she was sick. Then the Health Department found out what other children had played with Dorothy at the time she was coming down with measles. The initials of these children are shown on the chart. E. C., A. G., and D. G. had already had measles and could not catch them again. The other children were quarantined. F. J. and A. J. came down with measles in two weeks, but since they were in quarantine no one caught the disease from them. M. T., R. B., and F. A. did not come down with the disease and, after the incubation period had passed, they were released from quarantine.

It used to be the custom of Health Departments to fumigate houses after all communicable diseases. Fumigation is a process of liberating certain gases in a house or building. This was done as an attempt to kill germs. The most common methods of fumigating were to burn sulphur or to heat formalin. It has been found that fumigation does not do much good, however. Health Officers now regard it as much more important to disinfect everything which the patient has touched than to fumigate the house after the disease is over. We still fumigate to kill rats or insects which may be carriers of disease.

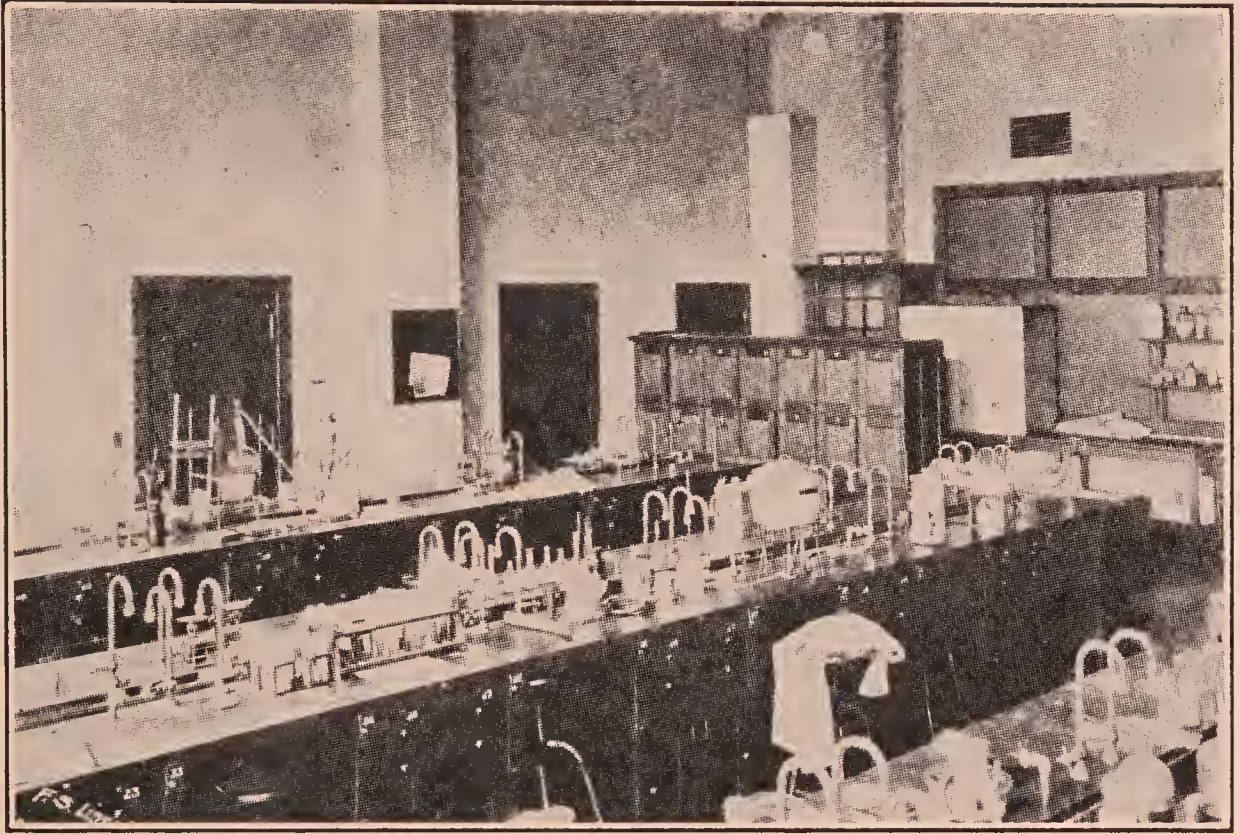
You have learned that diseases like smallpox and diphtheria are controlled through immunization. This is an important part of communicable-disease control.

Division of Hospitals. — A large city must have a Communicable or Contagious Disease Hospital. It frequently happens that a person cannot be cared for properly in his home. Often the home conditions are such that the disease would be almost sure to spread unless the patient is carried to a hospital. In order to safeguard the health of all the people in the city, therefore, the Health Department provides a special hospital and brings these patients to it. There is likely to be a Tuberculosis Hospital, too, and there may be other hospitals under the supervision of this division.

Division of Laboratories. — The laboratory of a Health Department does many interesting things. Here we find people specially trained and skilled in chemistry and bacteriology. Their work is related to that of many of the other divisions of the Health Department.

One of the most remarkable things which the laboratory does is to help physicians in the diagnosis of communicable disease. The various tests made are too difficult to describe here, but you will want to know that the laboratory helps physicians to determine the presence of diphtheria, typhoid fever, tuberculosis, meningitis, malaria, hookworm, and several other diseases. These laboratory tests discover signs of the germ in the discharges from the body of the patient.

Here is a story which shows how a public health laboratory helped to prevent an epidemic by discovering the person who, as a "carrier," was spreading typhoid fever although she herself was not sick. In a summer



A PUBLIC-HEALTH LABORATORY IS EQUIPPED FOR
CHEMICAL AND BACTERIOLOGICAL WORK

resort on the Atlantic coast, a few years ago, a case of typhoid fever appeared in one of the hotels. A few days later another case appeared. Such diseases are reported to the Health Department, and the Health Officer immediately started an investigation. He found that the people with typhoid fever had lived at the hotel for a month; thus he knew that they had picked up the germs of the disease after they had come to the summer resort. He made a careful study, therefore, to see where the germs could have come from.

He found that the drinking water was safe and that the milk which the hotel used was of excellent quality. Inquiry showed that none of the people in the hotel had

had typhoid fever recently. Bacteriological tests of body discharges showed that one of the cooks was a "carrier" of typhoid fever. She had had the disease two years before and had apparently recovered from it; but all the germs had not left her body.

If this summer resort had not had a good Health Officer and a good laboratory, no one would have found out where the disease came from, and an epidemic might have resulted. As it was, the cook stopped work and received treatment until she was no longer a carrier. No one else caught the disease.

The laboratory also keeps a check of the quality of the water supply, examining the water chemically and bacteriologically at regular intervals for signs of pollution. If the water comes from a lake or reservoir which contains microscopic green plants, the laboratory examines the water regularly for their presence. If they begin to increase in number, copper sulphate is added to the water in order to kill the algæ before disagreeable tastes and odors are developed.

The laboratory also tests samples of milk to make sure that it is clean and that it has not been watered or skimmed. Other food substances are tested in the laboratory to see whether they are adulterated. Samples of alcoholic beverages which have been found by the police are examined to find how much alcohol they contain. Frequently it is discovered that these liquors which have been sold unlawfully contain wood alcohol or some other substance which is deadly poison.

Is it not wonderful for the chemist to be able to take apart a substance like milk or other food, and for the bacteriologist to learn what bacteria are in a substance and how many of these plants are present? If your Health Department has a laboratory, it may be possible for you to visit it and see the various materials which are used in making these interesting tests.

Division of Food. — This division does the work of controlling food supplies. Restaurants and food establishments, like bakeries and delicatessens, are inspected to see that they are sanitary. Most cities require that people who serve the food shall have a physical examination or present a doctor's certificate showing that they are free from communicable disease.

Inspectors visit dairies and the establishments of milk dealers. They go to the stores to inspect ice cream and other foods. They collect samples of raw oysters, vinegar, butter, patent medicines, and beverages containing alcohol. These are brought to the laboratory for examination. Cold-storage warehouses and slaughterhouses are inspected.

Division of Sanitation. — Here is a large division with many interesting functions. Sanitary engineers are in charge of the purification of the water supply and the problems of waste disposal for sewage, garbage, and rubbish. They may have charge of mosquito-control work or they may be engaged in getting rid of smoke and dust.

In this division we also find many inspectors who go

about the city to see that sanitary conditions are maintained. They inspect the sanitation of factories, swimming pools, beaches, and houses. This division prevents sanitary nuisances. It controls the air conditions in public buildings.

Division of Child Welfare. — This division of the Health Department gives advice to the general public concerning the care and rearing of children. Well-Baby Clinics and Clinics for Pre-School Children are often organized. Day nurseries, where children are cared for during the day while the mother is at work, are supervised by this division. If the medical work in the schools is under the Health Department, that too is a part of the work of this division.

Division of Nursing. — The largest single group of workers in most Health Departments is the group of public-health nurses. Public-health nursing is a new profession, but already the nurse has become one of the most important public-health workers. She is not employed to take care of people who are sick, but rather to teach people how to care for others who are ill, and how to keep well by following the rules of health.

The public-health nurses of the Health Department are often divided into different groups — infant-welfare nurses, tuberculosis nurses, communicable-disease nurses, and school nurses. Some Health Departments combine all of the nursing activities and give to each public-health nurse a small district which she serves in all of these different respects, carrying her health



Courtesy of the Milbank Memorial Fund

THE PUBLIC-HEALTH NURSE IS A WELCOME VISITOR

message into all of the homes where she can be of assistance.

The founder of the great profession of nursing was Florence Nightingale. She was an English woman who became famous by developing nursing care for soldiers during the Crimean War in 1854 and 1855. She actually saved the lives of thousands of men in this war by the good nursing care which she was able to secure for them. After the war she did much to aid in the training of nurses to be messengers of health as well as aids in the cure of disease. The important place of the public-health nurse in the Health Department of today is a great tribute to the work and vision of Florence Nightingale.

Division of Vital Statistics. — In this division the health bookkeeping of the city is done. A record is kept of the births and deaths and the communicable diseases. Birth rates and death rates are determined. From this division we learn the state of health of the city, just as we learn from a physician the state of health of an individual. The figures which are prepared make it possible to compare the healthfulness of our city with that of others.

Division of Publications and Popular Health Instruction. — One of the privileges of the Health Department is to keep the people of the city informed on matters of health through newspapers, special bulletins, lectures, moving pictures, and exhibits. This work is done under a special division only in large cities.

The small town or city. — It has already been indicated that the organization and activities of all city Health Departments are not exactly alike. The description of the different divisions given above, however, will furnish a good idea of the general plan of work in the average city. In small cities and towns the work of the Health Department is not so extensive as to require all these different divisions or a large group of public-health workers. In fact, in many small towns the Health Officer works alone, or with one or two assistants, doing all the things which need to be done.

Such varied tasks require the attention of a person who is specially trained, and who has time enough to do the things well. A Health Department will not run

itself. In small towns it may be that a satisfactory piece of work can be done by a man who sells only part of his time to the Health Department. Sanitarians generally feel that, for any group of people of 20,000 or more, there should be a full-time Health Officer. Many smaller communities have trained Health Officers.

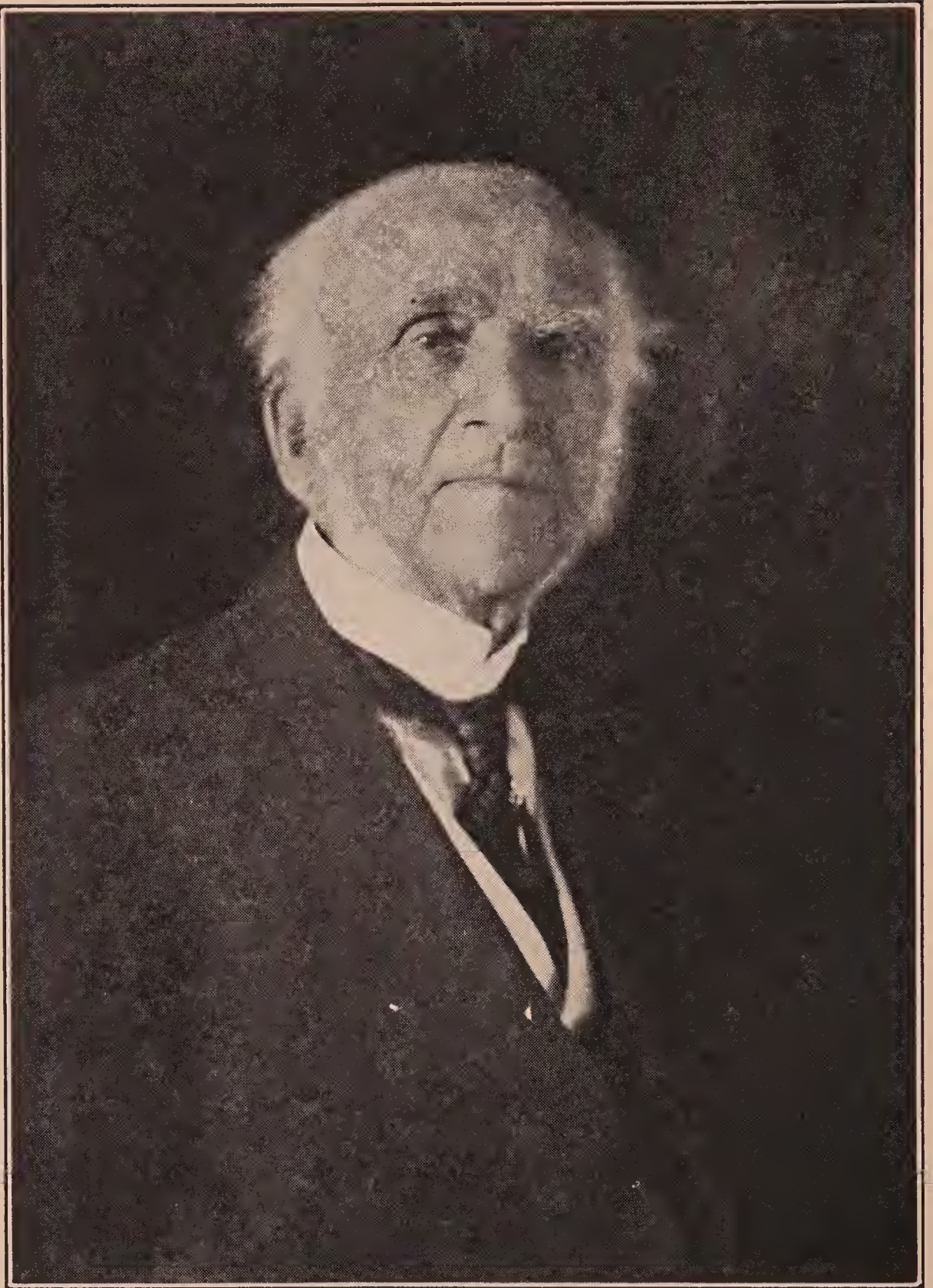
Trained sanitarians. — Public health is a distinct profession and has its professional society, the American



SEAL OF THE AMERICAN
PUBLIC HEALTH ASSOCIATION

Public Health Association, just as physicians have the American Medical Association and lawyers have the American Bar Association. There are many different kinds of sanitarians besides the Health Officer. There are the sanitary engineer, the bacteriologist, the statistician, the public-health nurse, and the epidemiologist.

Years ago, people did not understand the importance of public health, and it was thought that almost any one could be a Health Officer. It has too often happened that whenever a new mayor took office in a city he discharged the Health Officer and gave the job to one of his friends, often to some one who had not been trained in that kind of work. What kind of man should we have for a Health Officer, and how should he be trained? Perhaps some of you would like to become Health Officers.



Courtesy of the American Public Health Association

DR. STEPHEN SMITH (1823-1922)

First President of the American Public Health Association

As you look over the tasks and duties of the Health Department you may think that the Health Officer should be a sanitary engineer in order to handle the problems of sanitation; or you may think that he should be a physician because he needs to know about disease, but you remember that he does not treat sick people. When we are sick we want a well-trained physician with wide experience in treating diseases. We do not want our family physician to spend most of his time in a city Health Department and treat sick people as a side line. Neither do we want a Health Officer who spends most of his time treating sick people, and who gives only a few hours a week to the many problems of the Health Department.

The Health Officer should be a good business man if he is to run a large department, spend a great deal of money for the city, and have different kinds of people working for him. He should be a good administrator. It is also important that he be a good bacteriologist and understand laboratory work. You will see that he needs to know something about law, because when people break the public-health laws it will be his duty to bring them into court.

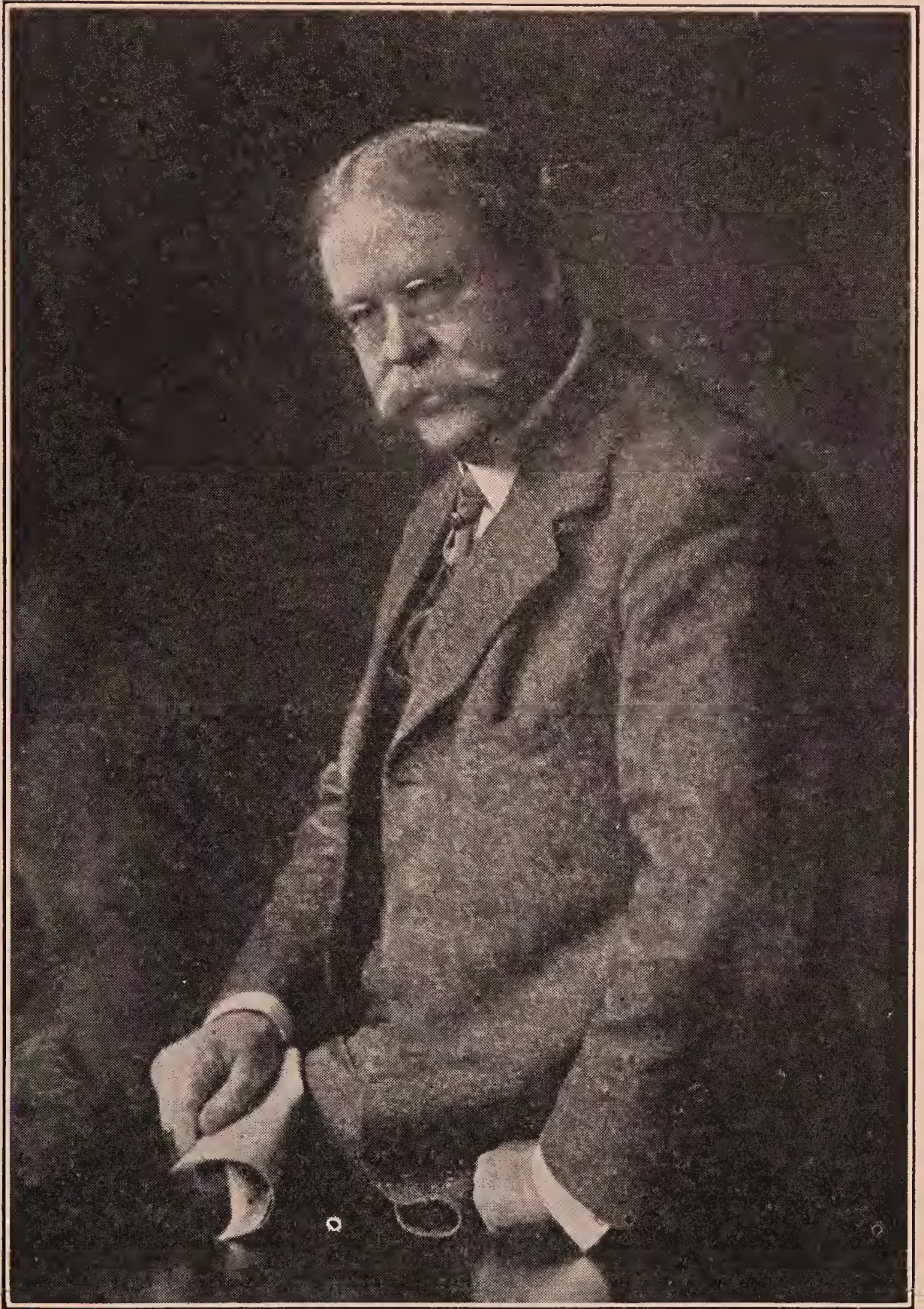
When you consider the varied activities of the Health Officer you understand why public health is a distinct profession, and why it is desirable to have a Health Officer who is specially trained or experienced in his work. No town would think of hiring a superintendent of schools who never had any experience with schools,

and yet many towns hire Health Officers who have had neither training nor experience. A man does not need to be an engineer, a lawyer, a doctor, and a bacteriologist. One could scarcely take time to learn all these professions, but he does need special training and experience in public health. Some men have gone directly into the study of public health from high school or college, and others have entered this field from one of the other professions.

At some future time, when you have become voting citizens, it may depend upon you to see that the Health Department in your city is run by a well-qualified Health Officer. He should be chosen because of his ability, and not because he is the friend of some politician.

Visit to the Health Department. — The Health Department in your city is doubtless doing many valuable things for your health. Do you know about its work? The Health Officer probably would be glad to have a student or a small committee from your class or from your school go to the Health Department, where he can tell you about his work. Remember that he is a busy man and cannot give you an unlimited amount of time; but he almost certainly will be willing to arrange some time when a committee from your school can see him. The committee may report to the class upon the work of the Health Department.

Here are some questions you may like to have answered during your visit to the Health Department: What kinds of records about births, marriages, diseases,



PROFESSOR WILLIAM THOMPSON SEDGWICK (1855-1921)
A Pioneer in the Training of Sanitarians



A VISIT TO THE HEALTH DEPARTMENT

and deaths does the Health Department keep? Does the Health Department have a laboratory, and what kinds of tests are made there? Does the Health Department have sanitary inspectors, and what do they do? Is the water supply purified? If so, how? What does the Health Department have to do with waste disposal? What does the Health Department do in controlling milk and other food supplies? How does the Health Department work with the School Department? How much money does the Health Department spend each

year, and how much is this per capita? Are there things which the Health Department needs in order to do better work?

State Health Department. — You have learned from the study of civics and government that most of our laws and regulations are made by the legislature of the state. Some things must be done for the state as a whole, and these are done by the state government.

The state legislature creates the State Department of Health and determines the relationship between it and the local Health Departments. Some state Health Departments have considerable control over city and county Health Departments; others have very little.

What are some of the things which the State Department of Health does? It keeps health records. It studies and helps to control communicable diseases. It may manufacture antitoxins and vaccines. It approves the sanitary engineering plans of towns and cities. It promotes health instruction. It runs tuberculosis hospitals and sanatoria.

National government and public health. — The Constitution of the United States does not directly assign any public-health work to the national government. The Federal government does some health work, however. The organization which does most is the United States Public Health Service, a part of the Treasury Department. You remember that the Secretary of the Treasury is a member of the President's cabinet.

The United States Public Health Service prevents

diseases from coming into the country and helps to prevent the spread of disease from one state to another. It studies public-health problems and helps to demonstrate the value of public-health work by coöperating with the Health Departments in different states.

Other branches of the Federal government do some public-health work, too. The Army and the Navy have their own medical and sanitary divisions. The Department of Labor has done much for the health of people in industry. The Department of Agriculture controls the shipment of foods and drugs in interstate commerce. The Bureau of Education in the Department of the Interior contributes to the health of school children.

Private health agencies. — Probably some of the public-health work in your community is carried on by agencies other than the Health Department. Do you know some of these? The National Tuberculosis Association is a large and useful organization which is supported by the people of the country, mainly through the sale of Christmas seals. The object of this association is to stamp out tuberculosis and improve the health of the people. Perhaps there is a Public Health Association where you live, or perhaps the American Red Cross is doing health work. There may be a Public Health Nursing Association, or health centers, hospitals, and dispensaries. Discuss these in class and see what you can find out about the various private agencies which are helping to make your community more healthful and happy.

QUESTIONS AND PROJECTS

1. Can you now give better answers to the questions at the beginning of this chapter?
2. What are the duties of a Health Department?
3. How is a Health Department organized?
4. What does the Health Department do to maintain sanitation?
5. What does a public-health laboratory do?
6. What must be done to control the food and water supplies?
7. How are communicable diseases prevented?
8. Why is food inspected?
9. Why is milk examined?
10. Why is the work of the Health Department more effective than it was before the time of Pasteur?
11. What can you do for the public health of your community?
12. Arrange for a committee to visit the Health Department and report to the class.
13. Write to the local Health Department, the State Department of Health, and the United States Public Health Service to find out what health pamphlets they have for free distribution. Study the list and secure those publications which the class believes to be interesting and useful for class study.
14. See what you can learn about the work and publications of private health agencies mentioned in this chapter.

XIII

SAFETY

Why is accident prevention important?

Is safety a community problem?

What are the agencies which help to prevent accidents?

What is the proper attitude toward safety and accident prevention?

Is safety a health problem?

It is half past five on a week day in the city — the time of day when traffic is at its height. Tired people are anxious to reach home and are impatient of delays. At a crowded corner a policeman holds back the automobiles while the pedestrians cross the street. They are nearly across, and the officer blows his whistle for traffic to move. One young woman, somewhat behind the others, slackens her pace as she turns back to look anxiously for her friend whom she has lost in the crowd. She catches her French heel between two stones of the poorly paved crossing and falls in front of an approaching car. The driver jams on his brakes and swerves his car quickly to the side, but he cannot avoid an accident. There are two broken ribs, a broken arm, and many painful days in the hospital.

How is the blame distributed among those who were connected with the accident? For what things was the girl herself responsible? Was the policeman at fault at

any point? What neglect in street maintenance added to the chance of accident? Was the driver of the automobile to blame? In considering any accident, we see the many problems which are involved in accident prevention.

Sometimes we think that accidents are confined to great cities and to places where machines are at work. This is not so. There are almost as many accidents in homes as there are from automobiles. Safety has always been a problem. Boys and girls in pioneer days had to look out for wild animals, while you and I have to look out for automobiles and street cars. Wild animals seem much more dangerous, but they never killed as many boys and girls as does the automobile.

Kinds of accidents. — There have always been accidents among people of every nation in every age. Do you remember the Bible reference in the writings of Saint Paul (II Corinthians xi, 26)? He speaks of being “in journeyings often, in perils of waters, in perils of robbers, in perils by mine own countrymen, in perils by the heathen, in perils in the city, in perils in the wilderness, in perils in the sea, in perils among false brethren.” To avoid dangers has always been one of man’s important problems. The kinds of accidents, and the steps to be taken in order to avoid them, change with living conditions, with the kinds of work which men do, and with the growth of city life.

Is safety a health problem? Let us look at some actual figures regarding the number and kinds of accidents,

and then see what the community should do toward preventing them and what you and I can do as individuals.

According to figures prepared by the National Safety Council, 90,000 deaths were caused by accidents in the United States in 1925. This was about twelve times the number of deaths from typhoid fever (7430), and nearly two hundred and fifty times the number of deaths from smallpox (361). Of course, it is true that we need not have had any smallpox at all (ten European countries were free from smallpox during that year); but the point is that accidents are much more important than most people realize. We think of smallpox and typhoid fever as being important health problems, as indeed they are. But see how many more deaths are caused by accidents!

The following figures show the different kinds of accidents which caused the ninety thousand deaths.

<i>Public Accidents</i>	46,000
Automobile.....	22,000
Railroad.....	7,800
Street Car.....	1,800
Drowning.....	7,000
Others.....	7,400
<i>Home Accidents</i>	20,000
Asphyxiation and suffocations.....	4,000
Burns.....	3,800
Falls.....	5,400
Poison.....	1,000
Others.....	5,800
<i>Industrial Accidents</i>	<u>24,000</u>
Total Accident Fatalities.....	90,000

Of course there are many accidents which are not fatal. Here are some other facts for the year 1925 from the same source as the figures quoted above:

The number of non-fatal automobile accidents was	660,000
The economic loss from street highway accidents was.....	\$600,000,000
The number of fatal accidents among children under fifteen years of age was.....	20,700
The number of lost-time accidents in industry was	3,000,000
The economic loss for industrial accidents in the United States was.....	\$1,000,000,000
The economic loss for automobile accidents was	\$600,000,000
The economic loss for fire accidents was.....	\$550,000,000
The economic loss from home accidents was.....	\$850,000,000
The total loss from industrial, fire, automobile, and home accidents was.....	\$3,000,000,000

Automobile accidents. — You will see that the greatest single cause of accidents in the above list is the automobile. The number of deaths caused by the automobile is increasing rapidly each year because more and more automobiles are being used. It was not so very long ago, of course, that there were no automobiles. If we look at the causes of death in New York City we find that up to the year 1898 there were no automobile fatalities. In the year 1899 there was one death from an automobile accident; in the year 1900 there were five; and in the year 1925 there were 1022.

The following table shows the kinds of fatal automobile accidents as classified by the National Safety Council.

Automobile <i>vs.</i> pedestrian	15,000
Automobile <i>vs.</i> automobile	2,330
Automobile <i>vs.</i> railroad	1,400
Automobile <i>vs.</i> street car	600
Automobile <i>vs.</i> fixed object	1,200
Non-collision	1,270
Others	<u>200</u>
Total Automobile Fatalities	22,000

A city government regulates traffic by its speed laws, its rulings in regard to one-way streets and one-way turns, its system of traffic signals, and its traffic police. Through the proper maintenance of streets and sidewalks, the city removes those obstructions—such as broken pavings, unused car tracks, and roots of trees—which may cause needless accidents.

No matter how much the city does, however, traffic conditions cannot be made foolproof. The behavior of each individual who is a part of the traffic has an effect upon the safety of that individual and of others. The city cannot protect you if you will not protect yourself.

Here are some of the rules governing pedestrian traffic: Cross the street where there is a traffic officer or a flashing signal. Wait on the sidewalk until you have the signal to go; then cross the street, paying attention to the business of traffic rather than to conversation.

When you wish to cross the street where there is no



Courtesy of National Safety Council

ACCIDENTS COST MONEY

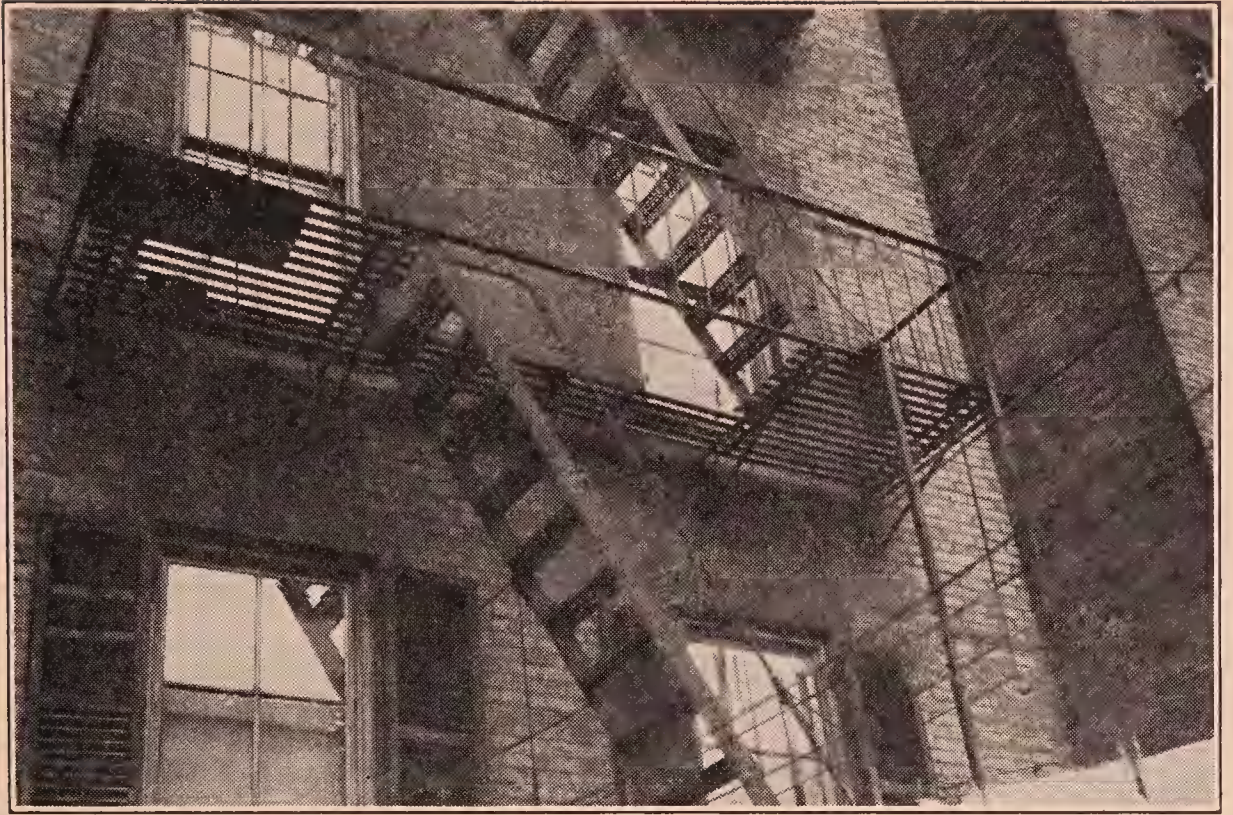
traffic officer or signal, take extra precautions. Remember that drivers of automobiles are always on the lookout for people entering from side streets, and that these places are the best ones to choose for crossing. Look in *both directions* and wait on the sidewalk until

you have an opportunity to cross in safety. *Walk* across the street, keeping your eyes open for traffic. If you feel that you have to run in order to get across in time, you had better wait.

There are many other considerations in this problem of traffic. How should one get off a street car? How should one get on a street car in a busy street? How do playing children add danger to traffic for themselves and for other people? What can you do to increase traffic safety for yourself and others? What is the responsibility of automobile drivers for traffic safety?

Fire accidents. — Accidents from fire arise in various ways. Some one said long ago that fire is a powerful servant but a cruel master. As a servant, it gives us comfort and provides power for manufacturing and for transportation. As a master, it destroys property and injures human lives. Every child must understand when very young that fire is no plaything; that matches, gas flames, and electricity are to be handled only by those old enough to control them. Unfortunately, even grown-up people are sometimes careless in the handling of fire, so that every year there is great loss of life and property. What fires have you known about, and what were the causes?

The community, in fire control, makes a direct attack, as it does in traffic control. The Fire Department in your city protects you day and night for three hundred and sixty-five days a year. Fancy trying to provide for yourself such expensive equipment. What you could



WHAT LESSON DO THESE PICTURES TEACH?

not do for yourself, your city government can do. Fire Departments are expensive, as indeed are Police Departments, but should you like to live in a city without this constant protection?

What is your part in fire control? First of all, you practice intelligent care in handling fire. You know what to do in case of fire and how to call the Fire Department. You help to keep little children from fire accidents. You take part in fire drills at school and notice fire exits when you are in public buildings.

Accidents from falling. — Many accidents are due to falls. Were you ever injured by falling? How did it happen? What other kinds of falling accidents have you heard of? How could these accidents have been avoided?

The community has some responsibility in regard to these accidents too. Streets and sidewalks must be kept in repair. In winter time snow must be removed and icy sidewalks covered with sand, ashes, or salt. Public buildings are required to maintain stairways in good condition, to provide handrails at stairways, and to avoid obstruction in corridors and passageways. How is the proper lighting of stairways and halls related to these accidents? What has a yearly clean-up campaign to do with the safety of back stairs and fire escapes?

Other accidents. — There are many other sources of danger. There are accidents from electricity (fallen wires), from drowning, from firearms, from fireworks, at

railroad crossings, and from machines in factories. Refer to the first table in this chapter and discuss these safety problems in class, trying to determine the responsibility of individuals and the responsibility of the community in each case.

Alcohol and accidents. — You already know that the use of alcohol increases the chance of accidents. A large number of automobile accidents occur because the drivers are under the influence of liquor. The enforcement of prohibition by the government is very directly related to accident prevention.

Safety activities. — The National Safety Council has made the chart of community safety activities on page 180. Discuss the meaning of the different items in this chart and see which of these activities you know to be going on in your community.

Safety responsibility. — If we happen to be in positions where we are especially entrusted with the safety of other people, we are under great obligation to meet that trust worthily. What positions or occupations do you think of which carry obligations for the safety of other people? What responsibilities are common to every one?

In safety, as in other things, let us conduct ourselves as intelligently as possible. The boy who does show-off tricks, such as “hooking” rides in traffic or dashing across the street in front of a rapidly moving car, is not smarter than other boys. As a matter of fact he is less intelligent than other boys in regard to that particular

COMMUNITY SAFETY ACTIVITIES

REMEDIES	HAZARDS			
	<i>Traffic</i>	<i>Other Public</i>	<i>Home</i>	<i>Industrial</i>
<i>Engineering</i>	Statistics or accident information			
	Street planning construction maintenance Traffic control Traffic regulations State laws, including drivers' licenses	Studies of important hazards, as — Drowning Theaters Fire Hospitals Falls Other public Elevators buildings	Studies of home hazards Location Racial groups	Safe conditions in each plant
<i>Education</i>	General public education: publicity, posters, radio, films, meetings, special safety campaigns			
	Safety instruction in schools; junior safety councils Safety education on playgrounds School patrols Commercial driver activities Private drivers' schools Brake and headlight inspections	Special educational campaigns on the above hazards	Education of groups involved through social service and other agencies	Industrial safety schools Foremen Watchmen Supervisors First aid Elevator Executives Fire Workmen Inter-plant visits Safety Engineers' Club Insurance inspections
<i>Enforcement</i>	Traffic law enforcement Police Courts	Enforcement of safe practices where required	Building inspection Fire inspection Health inspection	State labor department inspections

thing. It is foolish to risk one's own body needlessly, and it is a serious matter needlessly to expose other people to danger.

On the other hand, only the selfish person considers his own safety when something important is at stake.



COULD YOU RESCUE A DROWNING PERSON?

The civil engineer and his men risk their lives in the construction of great bridges and aqueducts. The locomotive engineer or the captain of a ship may sacrifice himself in time of accident to save those entrusted to his care. The telephone operator dares the fire or the earthquake shock in order to spread the alarm. Members of the Police Department and the Fire Department are subject to constant risk. Scientists throughout the



Courtesy of the National Safety Council

ARE YOU RESPONSIBLE FOR SAFETY?

ages have risked their lives in studying ways to overcome disease and add to the joy and safety of living. You and I are willing to sacrifice health or life itself when the cause is worthy.

We often use the slogan, "Safety first"; but that

phrase does not mean that safety should be one's first consideration throughout life. "Safety always" is a good slogan; but we shall define safety as refraining from taking needless and foolish risks. The phrase, "Choose your adventure," has been used to express this idea. What does that mean to you?

PROBLEMS AND PROJECTS

1. If you have a safety council in the city, consult it for information in regard to the safety program in your city.
2. Learn from the Police Department what it does in the interest of safety.
3. Develop four-minute speeches on safety and give them throughout your building.
4. Outline the safety problems of your school. Consult your principal in making up the list.
5. Organize a Class Safety Council.
6. Report to your Class Safety Council the things you do in the interest of safety. Here are some of the things which pupils have reported in other places:
 - (a) I told a fireman of a broken fire escape.
 - (b) I warned my father to keep the garage door open when he starts the car.
 - (c) I take a kindergarten child to school every day.
 - (d) I helped an old man across the street.
7. Discuss community responsibility in relation to the following questions:
 - (a) What do building regulations have to do with safety?
 - (b) What responsibility has the Street Department for safety?
 - (c) How is city lighting related to safety?
 - (d) What could a Safety Council do to promote safety?

XIV

THE CITY PROVIDES RECREATION

Do modern play activities differ from those of ancient civilizations?

Has the development of cities made any difference in the play activities of boys and girls?

What is the relation between recreation and health?

Why is it worth while for a city to spend money on parks and playgrounds?

Play has been an important factor in the happiness and progress of the human race from the very dawn of history to the present time. Long ago, in the time when Greece boasted the highest civilization in the world, the great philosopher Aristotle wrote: "That we should be able to enjoy leisure honorably is of all things the principal. In all cities there are family meetings, clubs, sacrifices, and public entertainments to promote friendship; for a love of sociability is friendship itself; so that the end for which a state is established is that the inhabitants of it may live happily. . . . The political state is founded, not for the purpose of men's merely living together, but for their living as men ought."

The part which play contributed in some of the early civilizations is told in a delightful way by Bowen and Mitchell in *The Theory of Organized Play*. "Excavations in the ruins of ancient Egypt and Babylonia reveal

toys such as dolls, tops, rattles, and various other trinkets of pottery and metal, showing that the boys and girls of those remote civilizations had their play life. The Chinese, Koreans, Peruvians, Aztecs, and other ancient races have left traces of their play in the toys of children and in the drawings and crude sculptures that depict boating, hunting, and festival scenes."

In another book about play, prepared by the Playground and Recreation Association of America, we find other interesting items as to the history of play. "Public festivals, dancing, and music were favorite forms of recreation with the Egyptians of early times. The ancient Hebrews had their celebrations when the harvests were gathered in, and religious festivals were permeated with a spirit of joy finding expression in singing and dancing.

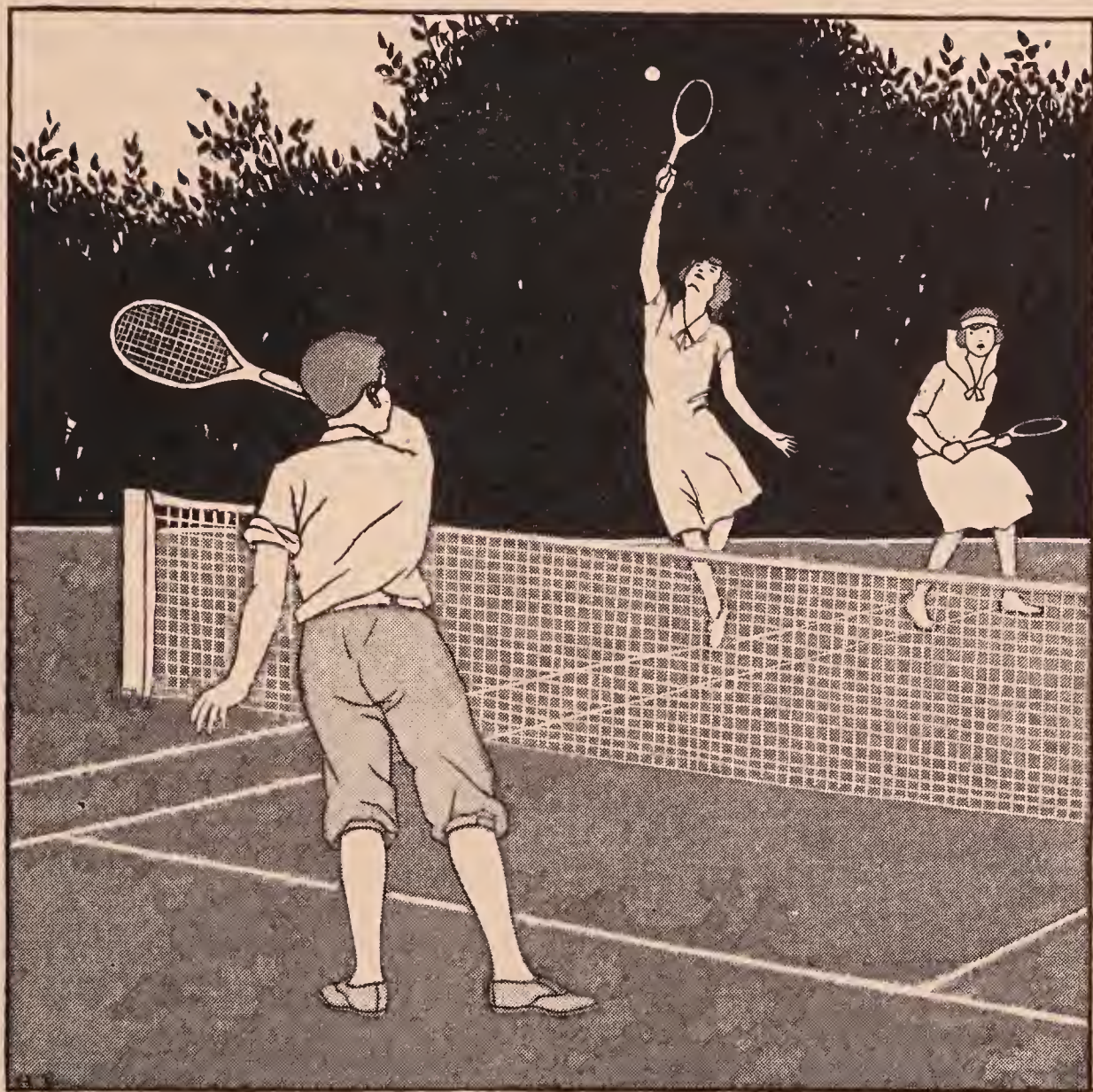
"The sports and athletic contests of the earlier Greeks, in which there was widespread participation, are acknowledged to have contributed in a large degree to the leadership of early Greece, not only in physical vigor but in the country's intellectual, art, and cultural life."

Recreation in country and city. — Perhaps never before were play activities as much needed as they are today. A few generations ago most of our people lived in the country or in villages. At that time most people were engaged in occupations which required vigorous physical work. Each man had the opportunity to see the results of his own labor and to take a just pride in his accomplishment.

Today we have become a nation of city dwellers. Large numbers of people work at occupations which require no vigorous exercise. Under our factory system of manufacture, many people are deprived of the satisfaction which comes from seeing the results of one's own work. Of course, we all get enjoyment from work if we enter into it whole-heartedly. Often we can make play of our work. But in any case opportunity for vigorous exercise, for self-expression, and for pleasure in personal accomplishment is to be found in the hours of play.

Conditions for play have changed, too, with the change from country to city life. Listen to any group of grown-ups who were country-born and see how different were their activities from those of the city child today. In their childhood days the opportunities for outdoor play were so inviting that children could scarcely be kept indoors. They had no need to beg, "Oh, tell us something to play!" for they were busy from one year's end to another with their own schemes and plans.

How different is city life today! Woods, fields, and seashore are available to only a small group of children, or are available only on special occasions after a long trip on the street car or in an automobile. Many a child has only the city street and a small yard in which to play. As a result, he either plays under conditions which are unsatisfactory or even dangerous, or he scarcely plays at all.



Community responsibility. — What can be done? Clearly, cities must provide opportunities for play. It is, of course, an expensive undertaking to set aside land for parks and playgrounds, to provide gymnasias and swimming pools, and to furnish equipment and leadership for the play program. We have come to believe, however, that money spent for recreation is money well invested.

A community profits in many ways by spending

money to provide opportunities for play. Joyous outdoor activity is essential to health, and health is above money value. Playgrounds help to make law-abiding citizens. Perhaps the most important reason for furnishing opportunities for play is that play makes people happy.

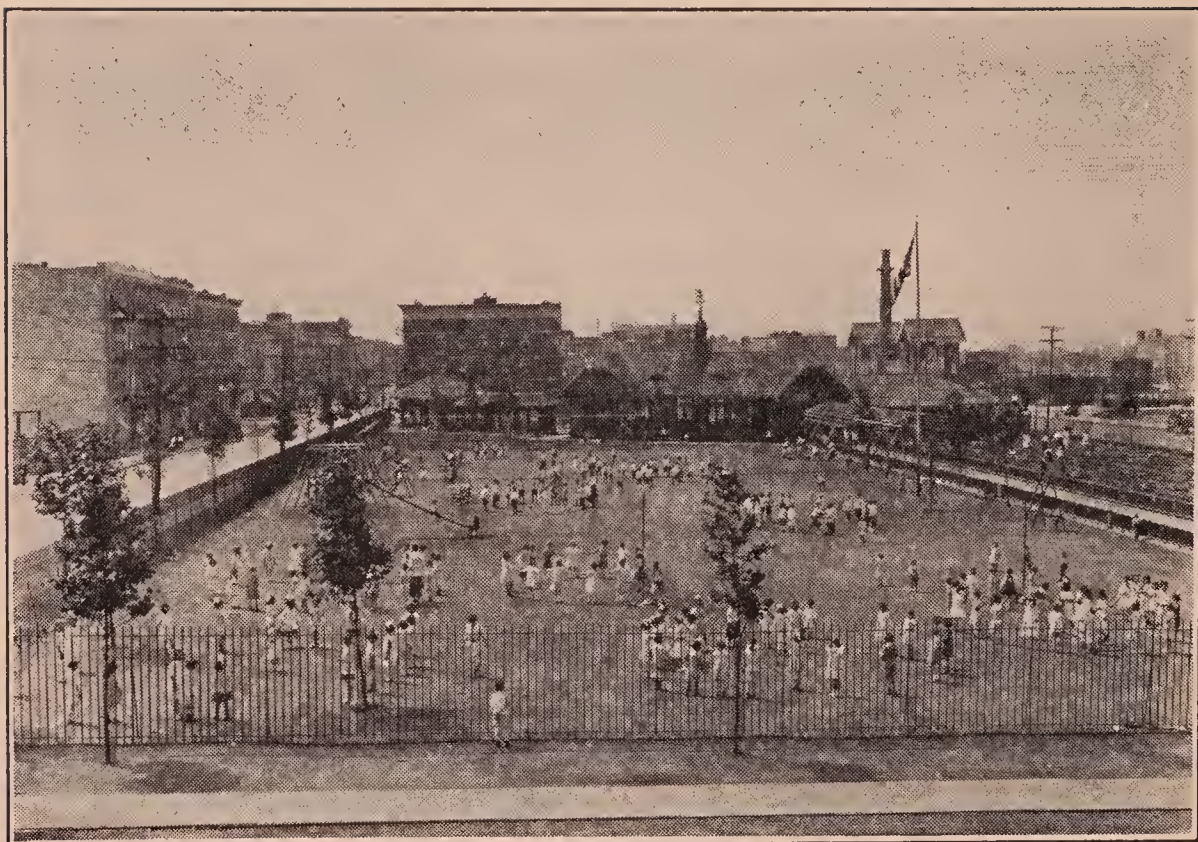
In providing recreation for the community, there should be a wide range of activities, in order that every individual may find the things which are attractive and satisfying. There should be opportunity for those things which are related to mental and spiritual refreshment, as well as those related to physical exercise and development of body. In one large city the recreation activities include team games, sports, gymnasium, class work, clubs, handicraft, hiking, gardening, social dancing, movies, concerts, lectures, dramatics, reading, photography, and collecting stamps.

The Playground and Recreation Association of America makes the following recommendations for a community recreation program. A community which has a population of eight thousand or over should have a full-time director of recreation. The program of activities should extend throughout the whole twelve months of the year. It is the responsibility of the community to maintain recreation service, and tax money should be used for its support. The emphasis should be upon helping people to a worthy use of leisure time. Although the recreation program begins with playgrounds for children, it should increase progressively until it includes

other features to supply all ages and all kinds of people with vital interests. Every boy and girl has a right to learn a number of games for outdoor and indoor use. Boys and girls learn to sing so that they may sing at their work or play. All young people employed in industry should have an opportunity in free hours to enjoy companionship and social life.

Every new school building should have a certain minimum amount of space for playgrounds. Nearly every new school building should have an auditorium, preferably on the ground floor, constructed so that it is suited for community uses. Every child under ten years of age living in a place with a population of eight thousand or over should be given opportunity to play upon a public playground within a quarter of a mile from his home. There should be sufficient area for boys to play baseball and football. There should be opportunity for boys and girls to swim in summer and, so far as possible, to coast and skate in winter. Every boy and girl should have the opportunity, either on his own home grounds or upon land provided by the community, to have a small garden. In new real-estate developments of five acres or more, not less than one-tenth of the space should be set aside for recreation purposes, just as a certain amount is set aside for trees.

These recommendations suggest an ideal which few, if any, cities can reach immediately, but the recreation movement is spreading rapidly. In more than one hundred and forty cities at the present time there is a



Courtesy of the American Child Health Association

PUBLIC PLAYGROUNDS

Municipal Recreation Commission, usually consisting of five members appointed by the mayor of the city. The members of the Commission usually serve without pay, and are responsible for the planning of the community program. Under their direction is a recreation leader, or director, who gives full time to the actual directing of the work. He has such assistants as are necessary.

Playgrounds. — Space for playgrounds is a difficult problem in large cities. Many cities regret their lack of foresight in planning play space, and it is important for small but growing cities to provide land for this purpose before it becomes too expensive. According to the standards of the Playground and Recreation Association of America, a community should provide an acre of play space for every four hundred children of elementary school age, and, if possible, for every two hundred.

There are various ways in which the playground space is being supplemented. Sometimes back-yard fences are removed, so that several back yards are thrown together, giving an area which supplies an excellent playground once it is cleaned up and equipped. Certain streets in some cities are set aside for play activities — for coasting in winter or for roller skating and games in summer. Street showers in hot weather are a blessing in crowded districts where bathing beaches and swimming pools are out of reach.

Good playground leadership is most important. It enables children to develop through games the spirit of coöperation, the ability for good team work, and the

poise which enables them either to lose or to win with good sportsmanship.

School playgrounds are an important part of the community play space. During the school year they furnish a place for activity at recess, at noontime, and before and after school. In summer they may be used as community playgrounds under supervision. So important is the school playground in the community that many states now require that plans of all new buildings shall be submitted to state authorities for approval, and no plan is approved which does not have adequate play space.

Parks. — A large part of the play space in a community is usually in the public parks or reservations.

“ The practice of setting aside spaces for park purposes is of long standing. When the Spaniards founded Santa Fe in 1565, a square or plaza was set aside in the center of the town for a public square. These early town builders frequently reserved large areas of land in the vicinities of the town known as ‘ pueblos ’ or public lands. Many years later the English colonists on the Atlantic Coast followed the custom of setting aside spaces for town commons. This was especially true in New England, where the town common became a recognized institution. William Penn, in 1682, in laying out the plan of Philadelphia, carefully reserved at regular intervals five public squares of about six acres each. Other city planners, such as General Oglethorpe, who laid out Savannah in 1733, and Brigham Young, who developed the plan for Salt Lake City, set aside squares and open



PARKS PROVIDE SPACE FOR PLAY

spaces. With a possible exception of Savannah, these early examples of the setting aside of land for future use were forgotten in the century that saw the rise and expansion of modern industry and commerce. However, in the decade from 1890 to 1900 there came a dawning appreciation of the need of open spaces in urban communities, and within recent years there has been a tremendous development in city, state, and national parks. The national park area of the United States in 1924 comprised nineteen different properties, with a total area of approximately 7,234,908 acres. The development of state parks has also been very rapid, and in a number of states, as for example Connecticut, the recreation uses of the parks are noteworthy. . . .

“The recreation park varies in size, but should preferably contain from 100 to 250 acres. It is suggested that there should be one such park for every 40,000 people, tangent to or near the city limits of such population.”*

Private organizations and recreation. — Frequently private organizations, such as the Boy Scouts, Girl Scouts, Young Men’s Christian Association, and Young Women’s Christian Association, assist in giving to city people a recreation program which is equal or superior to that of their country cousins. There should be a close coöperation between these organizations and the directors of the community recreation program. There should also be generous support of these associations which add so much to the health and happiness of the people in the community.

Commercial agencies. — Much of the recreation in the modern city is supplied by commercial agencies, such as moving-picture houses, theaters, and pleasure resorts of various kinds. Much of this is wholesome recreation, but some of it is harmful. Remember that the forms of recreation which are most valuable are those in which the person himself takes part, rather than those in which he is merely an onlooker.

Individual responsibility. — What does your city offer? Are you profiting by the opportunities which are open to you? Do not forget that long hours spent in play out of doors will bring great returns to you in health, happiness, and success. The boy who wishes to develop

* From a report of the Playground and Recreation Association of America.



WHAT ADVANTAGES HAS THIS FORM OF RECREATION?

into a stalwart man needs an average of two hours or more of vigorous exercise every day. The girl who wishes to grow up with an attractive figure and clear complexion needs the daily tonic of sunshine, exercise, and happy recreation. Take part in all the sports which interest you. As you grow into adult life, plan your days so that you may play several hours each week in the great out-of-doors.

Remember that both children and grown-ups need room and opportunity for play. There can be no hard and fast rule for organizing the leisure-time life of a community. The important thing is that its organization shall be nonpartisan and democratic. It should take into account all the different community groups. The responsibility for the success of the recreation program in a community must be shared between the private citizens and the city.

PROBLEMS AND PROJECTS

1. What recreation facilities are provided in your city? By whom are they provided?
2. Who has charge of the recreation facilities in your community?
3. Observe some playground in your city. Write a brief report, listing its advantages.
4. Make a list of all the various forms of outdoor recreation enjoyed by members of your class.
5. Arrange for the members of your class to keep records of their recreation and exercise for a week. See how much time you have spent in vigorous outdoor activity.
6. Make a list of the recreation facilities which every city should provide.

XV

SCHOOL HEALTH

How important is health as a part of education?

What are the health activities of a public school?

How much money does your community spend on the schools?

Who does health work in the public schools?

Do you ever consider why you go to school? There would undoubtedly be a variety of answers to this question in your class. One might say that he goes to school because he likes to learn new and interesting things. During your school days you have the opportunity to learn what the world is like, what the history of nations has been, who have been the great men and women of the past, and what they have thought or accomplished. You acquire knowledge and you develop skills which will stand you in good stead during later years.

If you think only of the present, you may say that you are happier in going to school than you would be in doing anything else. School is a social center as well as a place for study and work. Your friendships and companionships are an important part of your school life. "Be friendly." "Work hard and play hard." "Treat others as you would like to have them treat you." These are three guides to the path of happiness in school or elsewhere.

If you look ahead to the future, you may say that you go to school in order to fit yourself to make a good living. On the average, boys and girls who stay in school earn more money in later life than those who leave school early. From studies of actual earnings the National Education Association concludes that "Every day spent in school pays the child nine dollars. The child that stays out of school to earn less than \$9.00 a day is losing money, not making money."

It is quite obvious that school makes life more pleasant for you now, and that it enables you to prepare yourself for adult life. Through your knowledge of books, art, music, nature, and people, you increase your power of enjoyment. The various kinds of knowledge and skill which you acquire make you capable of doing more interesting work and earning more money. Your acquaintance with history and civics makes it possible for you to be a more intelligent and responsible citizen.

Where does health come in? Surely health is not an end in itself. It is worth while because it gives you freedom to pursue happiness and success without physical handicaps. Health increases your chances of reaching the goals toward which you strive. Learning to develop health and to maintain it is, therefore, one of the most important accomplishments of school life.

School health activities. — Here, as in other health activities, there is a responsibility upon both the individual and the community. Those who have charge of the schools should provide proper health activities and



GOING TO SCHOOL IS AS IMPORTANT AS GOING TO BUSINESS
sanitary conditions. Your part is to help in maintaining
the best possible conditions at school, and to regulate
your own life in a healthful manner.

The various activities in the school health program may be divided into three general groups: (1) health protection; (2) correction of physical defects; and (3) promotion of vigorous health.

Health protection. — These activities are chiefly the responsibility of the school authorities under the city government. It is their duty to protect pupils from health dangers at school, and to provide surroundings which are safe, from the standpoint of health as well as of safety.

A school building should be properly located. The classrooms should be sunny and airy, the grounds well drained, and there should be freedom from dust, noise, and disagreeable factory odors. It is desirable to have schools situated on streets which do not have so much automobile traffic as to make accidents likely.

Among the important items in the construction of the building are: protection from fire, adequate supply of good drinking water, a sufficient number of toilets and lavatories kept clean and light, a room for the doctor and nurse, a rest room for teachers, clean floors, and proper lighting for classrooms. Can you add other items to this list?

As pupils you have no choice in the location and construction of the building, but you can do much to help in keeping it clean and healthful. You can aid in keeping the floors, corridors, lunch rooms, wash rooms, and toilets clean. You can see that the bubbler fountains are properly used. By appointing a thermometer inspec-

tor in your classroom, you can help to regulate the temperature.

You can also help with the proper adjustment of chairs and desks. Here is the test for proper seating: When you are sitting with your hips pushed away back in your chair, your feet should be flat on the floor and your knees bent at right angles. When your arms are placed on your desk as in a position to write, your desk should be at such a height that your shoulders are in a natural position.

Another part of the health-protection activities is the control of communicable disease. The doctor, nurse, principal, and teacher play the leading rôles here, but the coöperation of every pupil is needed. Children who have measles, diphtheria, chickenpox, or a cold are required to stay away from other children until the doctor is sure that they can no longer give the disease to others. When a pupil returns to school after such an illness, it is his duty to report to the teacher, principal, or nurse before entering his classroom.

In many classes, during the morning inspection for cleanliness, the teacher observes whether any pupil has red or inflamed eyes, running nose, or flushed cheeks. Many of the communicable diseases, as you very likely know, have early symptoms like those of common cold. Any pupils who show such symptoms should be sent to the doctor or nurse at once in order to find out what is wrong, and thus protect other pupils.

It is the custom in many places for school doctors and

nurses to inspect all children after a vacation, to see whether any one has returned to school with a communicable disease. It is the duty of the doctor and nurse to decide when a sick pupil should be sent home, and to undertake whatever measures are necessary to check the spread of a disease at any time.

You may be interested to know that it was because of the fight against communicable disease that doctors and nurses were first employed for work in the schools. Forty or fifty years ago there was nearly always an epidemic of measles or some other communicable disease as soon as school opened. This has been avoided by the present-day system of medical inspection in schools. Before the days of the school doctor and nurse it was customary to close schools when an epidemic appeared. Now epidemics are controlled better by keeping the pupils in schools where they can be supervised very carefully.

Your part in this communicable-disease program is to obey the doctor's orders when you are ill, and to stay away from others when there is danger of your infecting them with a disease.

Another important thing which you can do to help solve the problem of communicable-disease control, both for yourself and for the community, is to be immunized against those diseases for which there is protection. What are they? Could your class promote a campaign to interest every pupil in your school in being immunized?

No man would think of running an automobile year after year without having it overhauled and the necessary repairs made. Of course the human body repairs itself to a large extent, but it needs to be examined occasionally for defects or difficulties which can usually be corrected if they are found in time. Growing boys and girls frequently have slight defects which hinder their growth and their progress in school. Many pupils have defective eyesight, sometimes without realizing it. If their eyes do not receive attention, headaches and other painful results are likely to follow. A boy whose heart is weak is better off to avoid vigorous play. Such examples show the need of physical examinations in school.

The custom in most places is to give the pupil a thorough examination when he enters school, and every few years thereafter. If for any reason he needs an examination between these regular periods, he receives it. Thousands of adults now go to their physicians every year to be examined. In school the examination is sometimes made entirely by the doctor, and sometimes in part by the nurse or teacher.

Correction of defects. — You can easily see that the health examination is of no value unless the defects found are corrected. Are you free from physical defects at the present time? With the aid of the hygiene teacher, home-room teacher, physical educator, or nurse, you can conduct a campaign to follow up the corrections of physical defects in your class. It would be



FORSYTH DENTAL INFIRMARY FOR CHILDREN

embarrassing for each pupil to have his defects posted on the board, but the total number of defects may be listed and the corrections recorded as they are made. Can your class secure a rating of 100 per cent on the correction of physical defects?

Maintaining and promoting health. — This is the most important and interesting part of the school health program. It is also the part which belongs primarily to you.

Principals and teachers plan the routine of the school so that the program will be healthful. Consideration is given to the length of the school day, suitable recesses, brief rest periods, and the school lunch.

Most schools have a daily health inspection during the

opening period or during a home-room period. Why is such an inspection valuable? Weighing and measuring at regular times enable you to watch your growth. How much have you gained in height and weight during the past year? Does this compare favorably with the gains made by other members of your class?

Some schools have a midmorning lunch of milk and crackers, an extremely helpful thing for many young people. Some need the extra feeding in order to make their desired growth; others find that refreshment at this time enables them to do better school work. Possibly you prefer fruit at the midmorning lunch period.

Relaxation periods or stretching exercises done with windows open furnish another way of relieving the fatigue which comes with constant sitting. Your schedule may be so arranged that you are moving from one room to another frequently and thereby get your period of relaxation in a natural way.

Physical education or physical activity. — What is the physical-education or physical-activity program in your school? Do you know what it is like for children in the lower grades? By whom is your physical-education program directed? What do you do in it and what do you like best about it?

Of course a physical-activity program contributes to health, but health is not its sole and primary object. Physical education is a part of the general process of education and, like the rest of the educational process, seeks to enrich life in various ways. Through physical

activity the body is trained to efficiency. Sports and games are more easily learned in youth, and they continue to furnish a source of enjoyment in adult life. Through games, you learn to play fair, to be a good sportsman, to be both a good winner and a good loser. Through your play activities you make friends and learn to get on happily with other people, and to compete with others without ill-will. Perhaps greatest of all is the joy which comes from the possession of a body which is physically fit and a mind refreshed by hours of happy recreation.

Health education. — This includes the many activities which pupils undertake, with the aid and direction of teachers, principals, and supervisors, for their own health improvement. Every one is interested in his own health, of course. When you were a very small child you did not think of it as you do now. Then it simply meant growing, playing, running, and doing the things which all children enjoy. Now health means to you a condition in which your body and mind are at their best. It means a fine development into manhood or womanhood. It promises a future with much happiness and success.

If you were asked to point out the way to health, what would you think most important? Undoubtedly you would decide upon habits of living. Have you ever stopped to consider what is meant by a *habit*? Look up the word in the dictionary. What health practices can you honestly say you have established as habits?

It is quite interesting to consider how habits are formed.

Sometimes you set yourself definitely to do a certain thing and continue it regularly until it becomes a fixed habit so that you do it without thinking. Sometimes you start to do a thing merely by accident and continue the practice until it becomes a habit. For example, some particular word or phrase becomes popular, and in a short time you find that you are using it constantly. Wherever you live you are almost certain to find an adjective or phrase, sometimes of good English usage and sometimes of slang origin, which is used continuously. Its use has become a habit.

Habits of living are established in the same general way. It is important to have the scientific facts in regard to health, but knowledge alone does not produce good habits. If you are well informed in matters of health, however, you are better able to choose those habits which you will deliberately seek to establish in your own life. Such habits are fixed by repeating them over and over again until it becomes easier and pleasanter to follow the habit than to do anything else. Bad habits which have become fixed accidentally or carelessly can be broken by a continued deliberate effort and by the substitution of a good habit. The use of tobacco or alcohol is a serious habit which interferes with proper growth.

You will find in general that, the older you grow, the more difficult it is to break old habits and form new ones. That is why it is so important to form the desired habits of living when you are young. One thing which you can



DAILY INSPECTION IS AN IMPORTANT PART OF THE HEALTH PROGRAM

do for your younger brothers and sisters is to help in their development of proper health habits. Your example will be a more powerful influence than anything you can say.

What activities are organized in your class to help each pupil to improve his habits of living? You have found in the Appendix some suggestions for interesting

projects. You and your teacher can think of many others. Remember that what you yourself do for your own health will always be more important than anything which can be done for you. Your health is affected, not by what you *know*, but by what you *do*.

The School Department of the city of Cleveland has set up in its health outline a few commonly recognized principles of healthful living, in the form of "The Ten Commandments of Health."

1. Keep the body clean.
2. Eat the right amount of wholesome food.
3. Get enough sleep and rest.
4. Keep the body erect.
5. Play and exercise properly.
6. Keep your school, home, and neighborhood as healthful as possible.
7. Keep a healthy mind.
8. Prevent accidents.
9. Avoid communicable diseases.
10. Know your own physical limitations and live within them.

The citizen and the school health program. — In a few years you will cease to be a pupil of the public schools. Very likely you will have children of your own in school. It is important to have the schools under the direction of capable people. It is also important to supply enough money for the support of the schools so that the necessary health conditions may be maintained. Because of the close relationship of health to the whole development of the child, the school health program is an extremely vital part of the community responsibility.

PROBLEMS AND PROJECTS

1. What could the Student Council do to promote health?
2. Rate your present health standing by using the "Personal Health Scale for Junior High School Boys and Girls" given in the Appendix.
3. What could a school newspaper do to promote the health program?
4. Under the three headings of (1) health protection, (2) correction of defects, and (3) promotion of vigorous health, list the activities which are carried on in your school.
5. In what ways have you profited personally by the health program in your school?
6. In what ways could health be promoted in your school by the use of competitions, bulletin boards, clubs, plays, assembly periods?

XVI

THE HEALTH OF THE WORKER

What kind of work do you think you would prefer to do when you finish school?

What are the things you like about this occupation?

Is one occupation more healthful than another?

What are the ten or twelve most common occupations in the community where you live?

What are some of the rare or less common occupations?

What factors should one consider in determining the healthfulness of a job?

Is it important to health that one should enjoy his work?

To what extent can a man control his own health regardless of his occupation?

What working conditions are there over which the worker has no control?

What may the worker expect from the modern industry in the way of health service?

What should we expect the government to do toward maintaining the health of the worker?

Choosing an occupation. — Have you thought of the kind of work you are going to do when you leave school? Probably you have; but have you stopped to think of all of the different kinds of work from which it would be possible for you to choose? Have you taken the trouble to learn something about these occupations in order to see which one you would like best? This is an important choice — picking out an occupation. Suppose you were

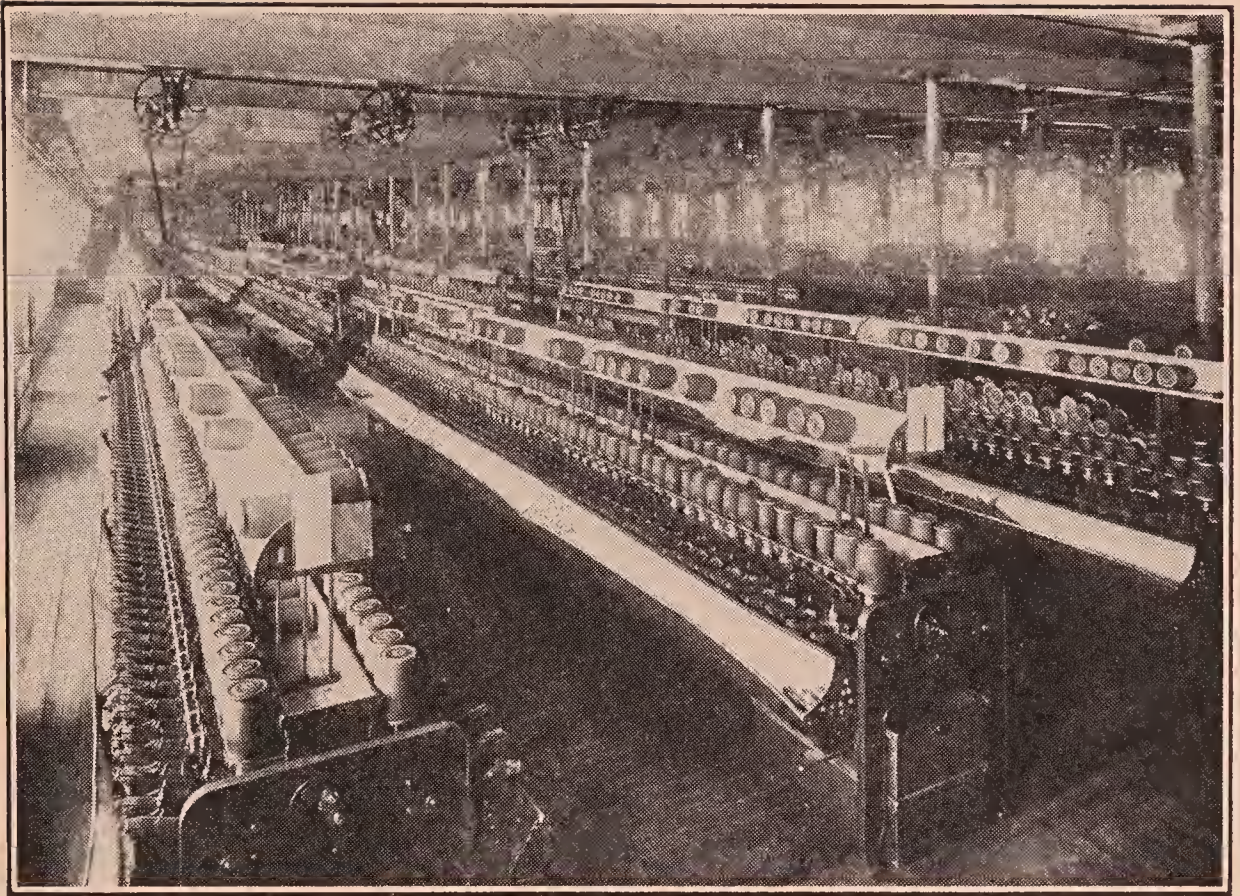


HAYING IN NEW ENGLAND

(Reproduced from the *Cyclopedia of American Agriculture*, by courtesy of The Macmillan Company)

to decide today what you would do every evening for the next ten years! You would want to be very sure that you selected something which you would enjoy.

Young people do not always stop to think, when they pick out a job, that they are deciding what they are going to do forenoons and afternoons, every working day for several years. Of course one cannot always choose the particular occupation he likes best, but it is usually possible to choose among at least a few occupations. Do you like work which takes you out of doors, or do you like to be indoors? Do you like machinery? Do you like gardening? Do you like to build things and plan things? You may like to find out what occupa-



A ROOM IN A TEXTILE MILL

tions are thought most interesting by different members of the class.

We find that when people learn to do a job well they usually like it. It sometimes happens that one does not like his job because he has not learned it thoroughly, and when he learns to do it well he enjoys it much more. Sometimes one chooses a job merely because it seems possible to make good money at it. But surely it would be foolish for one to agree to do something which he did not like, every forenoon and every afternoon, merely because it paid a little more money, if he could secure fair pay at something which he enjoyed much more.

One's success in his work influences his advancement; and, since one is more likely to succeed in a job which he likes, that is another reason for picking out the job carefully. We are particularly interested in this class in deciding upon the importance of health in relation to this problem of occupation. How important is health in picking out a job, and how can one maintain vigorous health in the job which he picks out?

The kinds of jobs available and their effect upon health differ in different parts of the world. The problem of keeping well and making a living is different for the Eskimo than for the Cuban, no matter what his particular kind of work may be. In your study of geography you will find it interesting to consider the kinds of occupations in different countries and their effect upon the mode of living and the health of the people. In history, too, you will find this same interesting relationship. How, for example, did the occupations and habits of people in America one hundred years ago compare with our present occupations and habits?

Work and health. — While it is true that different occupations may have an effect upon health, it is probable that the way one lives, the way he adapts himself to his job, and the way he takes care of his general health, are more important than the job itself. Suppose a man looked at his job in a factory, or in an office, or in a profession, in somewhat the same way that a college football player looks at the job of playing football when the season is on.



PRIZE STOCK COMPETITION

(Reproduced by permission, from Extension Bulletin 63 of the Agricultural Experiment Station of New Jersey)

Perhaps a better example would be the athlete who is giving all his time to training. Let us take for example the American Olympic team. The Olympic Games are held every four years, and they include every type of athletic sport. Practically all of the nations send teams to compete in these games. Any amateur athlete—that is, any one who has not played for money—can “try out” for this team. After the team is chosen it must travel to the country where the games are being held. When the United States team is formed, for example, the group of men and women meet in New York and go on board the boat which is to take them to Europe. Life on a boat would not be good for an athlete if he merely loafed and ate all the food which his sea appetite would suggest. He chooses his food carefully, however; he secures the right amount of sleep and has vigorous exercise every day. When he is traveling by train he is again in a place



SKILL, COURAGE, AND PHYSICAL FITNESS ARE DEMANDED
IN THIS OCCUPATION

where it is difficult to continue his athletic training. Nevertheless he finds a chance to get out sometime during the day for his exercise. He sleeps and rests enough, and takes care of such other habits of living as are important for athletic proficiency.

In somewhat the same way the person who works in an office needs a schedule outside of working hours which will make it possible for him to keep fit. The health rules which we follow as pupils in school are equally essential for adult life and for maintaining working efficiency.

The person who is doing hard muscular work needs to plan for relaxation. The one who is working a particular

set of muscles needs to plan exercise for the other muscle groups. The person who is doing mental work does not get so much exercise as the person who is doing muscular labor, unless he secures physical activity through sports and recreation. As a matter of fact, the failure to follow any of the basic rules of health — drinking enough water, eating vegetables, having a daily bowel movement, keeping the body clean inside and out, and getting the right amount of food — will more or less incapacitate a person for his job.

Hours of labor. — One of the things about a job that have an effect upon health is the number of hours a person works per day or per week. Naturally the more work one is able to do, the more money he will make. It would at first seem that the more hours per day one worked, the more work he could do. This, however, is not true beyond a certain limit. In the first place, we must recognize that there are different kinds of jobs. A man can ride horseback longer than he can play football. Likewise a man could work longer as a teamster driving a span of horses and hauling logs than he could as an engineer driving the engine of an express train.

The human body is a machine which uses up its energy by physical effort, but which has the peculiar power of getting rested during relaxation and sleep. It may get tired in six hours of working very rapidly, or it may take ten hours to become equally tired if it does a less strenuous kind of work. By experience we should be able to tell what the best number of hours per week

would be for each kind of job, allowing for the greatest amount of work without injuring the health of the worker.

It has sometimes happened that people have worked too many hours a week. When the length of the week was reduced, the amount of work done was increased. For example, during the war, England made ammunition with the greatest possible speed. Many people worked seven days a week, but it was found after a time that they could do more work in a month by working six days a week than by working seven.

In other cases shortening the hours of the working day increased the amount of work which a man was able to do. On one particular operation in ammunition factories the number of hours of labor was reduced by about one-eighth (12 per cent), with the result that the amount of goods manufactured was increased by more than one-fifth (22 per cent).

• **Fatigue.** — The reason a man may actually do much less work if he stays at the job too many hours a day is that he gets too tired. Fatigue in industry is an important health problem, and there are a great many sides to it.

We must first understand what is meant by *normal* or *natural fatigue*. Every one is properly tired at the end of the day when he has done a good day's work with enough vigorous physical exercise. This is as it should be. The person is glad to go to bed and he sleeps soundly, waking up in the morning fully rested. If one becomes

too tired, however, he is not thoroughly rested by the night's sleep, and he has what we call *cumulative fatigue*. This may increase so much through the week that it is not dispelled by the full day of rest on Sunday. If this happens the worker becomes more and more tired, and does less work each day. Fatigue also increases accidents.

Let us recognize, too, that there is mental fatigue as well as physical fatigue. One does not work too *rapidly* mentally, but one may work too *long*. When one works rapidly, one's mind is thoroughly concentrated upon its task and does its best work. It is easier to work with good concentration than with poor concentration.

In fact a series of interruptions, or a condition in which the mind jumps from one thing to another, is most difficult and tiring. The brain becomes tired after a time. You may have found that you can do your studies a great deal faster when your mind is fresh, and you are feeling well, than when you are tired or when your mind wanders from your studies.

Mental fatigue is just as definite as muscle fatigue, and it takes longer for the mind to become rested than it does for the muscles. When one is tired physically, one feels like taking a long sleep, but when one is tired mentally, without having had physical exercise, one may realize only that one is nervous and irritable, without understanding that one needs rest. It is often helpful for the person who is mentally tired to become physically tired also.

Another cause of fatigue is poor living conditions. By this we mean that the home is not comfortable and the worker does not get the rest he should while he is in the house. He gets poor food, little sleep, and no real contentment.

A third cause of fatigue is poor transportation between one's home and one's place of business. One may have a long ride on the trolley cars or trains, which is tiring in itself, and which adds to the working day.

In the fourth place, there may be unnecessary fatigue because of the conditions of work. This happens if one works in a room where it is much too hot or where the lighting is bad; or if one sits in a chair which is not the right height; or if one has to work in an awkward position.

A fifth cause of fatigue may be the way in which the work is done. On some jobs it has been found that people will do more work by having short rest periods than if they work continuously. We may illustrate this with a true story of two groups of men who competed to see which group could dig the longer trench in a given length of time. One man had his team work continuously as hard as they could for the whole period. The other had his team work hard for a few minutes and then rest completely for a few minutes. The latter group won.

Another interesting example was the case of a man who found it possible to do three times as much work by allowing himself brief rest periods. He was loading metal on freight cars and he found he could do much more

on a program of work — rest — work — rest, than on a program of work — work — work.



OUTDOOR SPORT FOR THE INDOOR WORKER

It is easy to see that the length of the working day, the kind of work, rest periods, the suitability of one's food, sleep, rest, and daily habits are related to the fatigue of the worker, to his accomplishment, and to his health.

Dangerous trades. — While the conditions mentioned above are present in all kinds of work, there are, of course, certain jobs which are more dangerous than others. For example, one would say that being an aviator is dangerous, because it has not yet become possible to handle airships without accidents.

Working with lead or lead paint is dangerous, because when lead is taken into the body it acts as a poison. A worker may get it on his hands and swallow some while eating his lunch unless he has washed his hands properly. One of the results of lead poisoning is a stomach trouble which is commonly called "painters' colic." Another result is the loss of strength in the wrist causing "wrist drop." Lead poisoning is a particularly dangerous thing because the effects of lead poisoning are likely to appear in the worker's children. Many of the children of parents who have lead poisoning are not well and strong when they are born.

There are some other substances which are poisonous, such as arsenic, benzene, mercury, and wood alcohol. Carbon monoxide gas is a poison. You have probably read of men who have been killed from this poison by starting an automobile in the garage with the garage door closed. Carbon monoxide is produced when

substances are not thoroughly or completely burned. There is enough carbon monoxide in the exhaust gases of an automobile to cause death if these gases are allowed to accumulate in a closed garage. Whenever men are where poisonous substances are used in a process of manufacture, they must take such precautions as will prevent them from being poisoned.

In some occupations there is considerable dust, but proper habits of cleanliness will take care of the skin. It is somewhat more difficult to take care of the lungs. There is more tuberculosis among stonecutters, for example, than among farmers. This is because of the sharp, irritating stone dust. Mining coal is a fairly dusty operation, but coal dust does not seem to irritate the lungs very much. There is no more tuberculosis among coal miners than among people generally.

Tuberculosis is not produced by dust alone. The person who does not take good care of himself, and get enough rest, sleep, fresh air, and good food, is more likely to develop the disease. Alcohol increases the susceptibility of people to tuberculosis.

Going to work too young. — In general we see that the health and happiness of people are rather directly connected with the kind of job they pick out. It is particularly important for boys and girls not to go to work too young. Dr. Collis has shown that boys who used to go into the textile mills in England at the age of twelve did not grow as much between the ages of twelve and eighteen as other boys. Do not conclude, however, that boys and

girls must not do any work at all. All young people ought to help at home, and many kinds of work are just as healthful as playing games for the same length of time would be.

At what age is a boy allowed to go to work in the state where you live? What is the value of requiring a physical examination and a working certificate before a boy or girl is allowed to take a job?

Healthful working conditions. — We know that our health lies in our own hands. On the whole, probably the way we live has more to do with our health than the places where we work. Nevertheless, the conditions under which a man works are important. If one of us were to take a position in a factory, he would want to select one where the working conditions are healthful — not one where they are unhealthful. What are the conditions you would want?

If you took a job inside, you would want the factory to have good conditions of lighting and ventilation, would you not? You would expect safety to be secured as much as possible by putting guards over dangerous machines and teaching the workmen to avoid possible injuries. Poisonous substances would be handled in such a way that they would not endanger the health of the worker. If there is a restaurant at the factory, you would expect that the food would be clean and the restaurant well managed; that the people who handle food would be well; and that no person who had a communicable disease would be allowed to cook or serve



AN ATTRACTIVE CAFETERIA

the food. You would expect reasonable standards of cleanliness in the factory according to the kind of work which is being done.

Yet many factories go even further. The number of hours in the working day is adjusted to the kind of work done. Fatigue is studied, and ways are found to reduce it. Machines and chairs are adjusted so that workers may stand or sit in a proper, easy posture. Medical service is provided so that the worker may have a physical examination and the advice of a competent physician. Great care is taken to prevent the spread of any communicable disease in the factory. In some



A WELL-BUILT FACTORY

places industrial nurses visit the worker who is sick. Care is often taken to improve transportation to and from the factory so that the worker will not be unnecessarily tired in traveling to and from work. Dental service is frequently provided. Suitable opportunities for recreation help the worker to maintain and improve his health.

These activities to keep workers well are quite natural. In the country, when a farmer is choosing a man to work for him he considers the man's health as well as his ability. Having once hired him and become acquainted with him, the good farmer does everything he can to

make the work pleasant and to keep the man well and happy. In the large factories of cities many men are employed, and the managers cannot know every one who works for them. In such a case they have a Service or Welfare Department, where some well-trained person attends to all of the health needs in the factory, making plans to promote the health and happiness of the whole group of workers.

The government and the health of the worker. — We have been interested in a study of what our government does for us. What does it have to do with regulating factory conditions?

The government is interested in the welfare of the people, and it would be natural to expect it to deal with the health of people in industry. Indeed, it does do this, and the state government has a group of people, either in the State Department of Health or in some other department, which looks after the health of workers.

The state passes laws to prevent injurious conditions in industry. Most of the factories in the United States maintain conditions which are much better than those actually demanded by law. There are always a few people in every line of work, however, who either are careless or are not considerate of the welfare of people about them. It is wise, therefore, for each state to have a set of standards in order that no industry may be allowed to injure the health of its workers.

Laws have been passed in most states which prevent the employment of people for unreasonably long hours.

The conditions under which women and children are allowed to work are often specified by law, because the kinds of work which they can do without injury are limited. The state laws provide for the inspection of factories. Factory inspectors see that the laws are obeyed. Factory owners who break the laws are obliged to remedy the conditions or they are brought into court and punished.

Accident insurance. — One of the most important laws is that which requires every factory to insure all of the workers against accident or injury. If a man or woman meets with an accident at the factory the insurance money will pay for the medical service. If the person is kept away from work for more than ten days or two weeks he is paid a part of his regular wages. If he should meet with a serious accident, such as the loss of a hand, the insurance company pays him a large sum.

Of course no insurance can make up for a serious accident, but it is a valuable aid. The idea of insurance is fair, too. You might say that it is partly a man's fault if he has an accident; but he should not bear all the cost as well as the pain. Accidents are not intentional. A few are bound to occur in any industry. If people are going to be hurt in making some product, why should not the cost of those accidents be added to the price of the product? That is indirectly what happens when industries take out accident insurance for their employees. Some one must look out for a workman and his

family if he has been in an accident and has no money. It is much better that it should be done by insurance than in any other way.

The job and the man. — We have seen that the person who wants to take care of his health will consider that when he picks out a job. The occupation you select is very important, because in it you will spend many hours a day. Choose carefully and wisely and, once you have chosen, plan to maintain health, secure recreation, and be worthy of advancement in order that you may increase your service to others.

QUESTIONS AND PROJECTS

1. Can you now answer the questions at the beginning of this chapter?
2. Perhaps you can visit a factory in your vicinity and discuss in class the kinds of work which you see there and their relation to health.
3. Discuss various occupations in class.
4. What is your father's work, and what are the health problems involved?
5. Select two or three different occupations and make a list of the healthful and unhealthful conditions in connection with each.
6. Write to the State Department of Health for the rules and regulations of your state governing factory sanitation and the health of the worker.

APPENDIX

This Appendix suggests some procedures which have been found useful in junior high schools.

WEIGHING AND MEASURING

All weighing and measuring should be done carefully and accurately. Weighing should be done once a month — if possible, *always at about the same time of day*. Height should be taken at least twice during the school year — at the beginning and in January or February. It is desirable that the student be weighed and measured without shoes.

Weighing. — Before weighing, the scales should be tested for balance by pushing the balance weights back to zero. When the scales are found to vary somewhat from an accurate balance, they should be adjusted by the Sealer of Weights and Measures or by the teacher. If the scales are moved from one room to another, care should be taken to keep the platform relatively horizontal, so that the adjustment of the mechanism under the platform is not disturbed. The student being weighed should stand quietly in the middle of the platform with his hands at his sides.

Measuring. — Two instruments are necessary for measuring: (1) an accurate scale against which the person will stand to be measured; and (2) a leveling device which can be placed on his head to secure a right-angle measurement against the scale.

One of the best measuring scales is made of inextensible and unshrinkable paper, which may be tacked or pasted to a wall

or specially prepared board. It can be secured from the American Child Health Association, 370 Seventh Avenue, New York City. You may use yardsticks fastened one above another on a smooth wall, or a tape measure tacked to the wall. Be careful to have them accurately placed. Such a scale should be checked by a standard steel tape.

The leveling device may be made of two pieces of seasoned walnut board about seven by five inches. On the inside of the median line is a narrow strip with an opening which serves as a handle. If such a measuring device cannot be secured conveniently, a box with a square edge may be used. (A chalk box serves the purpose very well.) The flat surface of a book or board cannot be used accurately, because one cannot be sure that it will always make a right angle with the scale on the wall.

The person being measured should stand as tall as possible, with heels together and with his back and head against the wall where the scale is placed. His arms should be at his side, and his eyes straight ahead.

Records. — It is well to keep two sets of records — one on a classroom weight-record sheet and another on individual weight cards. A regular form of “Classroom Weight Record” can be secured from the Bureau of Education, Department of the Interior, Washington, D.C. The classroom record should be kept hanging where students can refer to it — in the home room, the hygiene classroom, or the gymnasium. The individual cards may be carried home at regular periods to be signed by the parent. Both records should give height, weight, and average weight for height and age.

It is desirable that junior high school students should have as large a share as possible in the weighing and measuring ac-

CLASSROOM WEIGHT RECORD

School _____

Grade _____



Teacher _____

Room _____

	NAME	Age	Height	Normal Weight	ACTUAL WEIGHT					Age	Height	Normal Weight	ACTUAL WEIGHT				
					Sept.	Oct.	Nov.	Dec.	Jan.				Feb.	Mar.	Apr.	May	June
1																	
2																	
3																	
4																	
5																	
6																	
7																	
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16																	
17																	

tivities. Certain ones can be trained to do the weighing, others to do the measuring. Each student can estimate the average for his height and age, and take part in keeping his own records, recording the figures on his own card or on the classroom weight record at the time he is weighed. It will be necessary for the teacher to supervise these activities.

Importance of weighing. — It is desirable that one should be within the zone of normal weight — between 10 per cent below average and 20 per cent above. (See Weight-Height-Age tables at end of Appendix.) It is more important, however, that one should be growing regularly than that one should conform exactly to average weight for his height and age. Boys and girls of junior high school age should gain from one-half to one pound per month.

After being weighed, each student should know his actual weight and how much he gained or lost. He should be expected to have an intelligent understanding of the relation of his health habits to his gain or loss in weight. Failure to gain for a month or two is not a serious matter, but the student who fails to gain should consider his daily habits carefully and correct those which are faulty. If he fails to gain over a period of three months or more, he should receive individual attention.

DIRECTIONS FOR MAKING A WEIGHT GRAPH

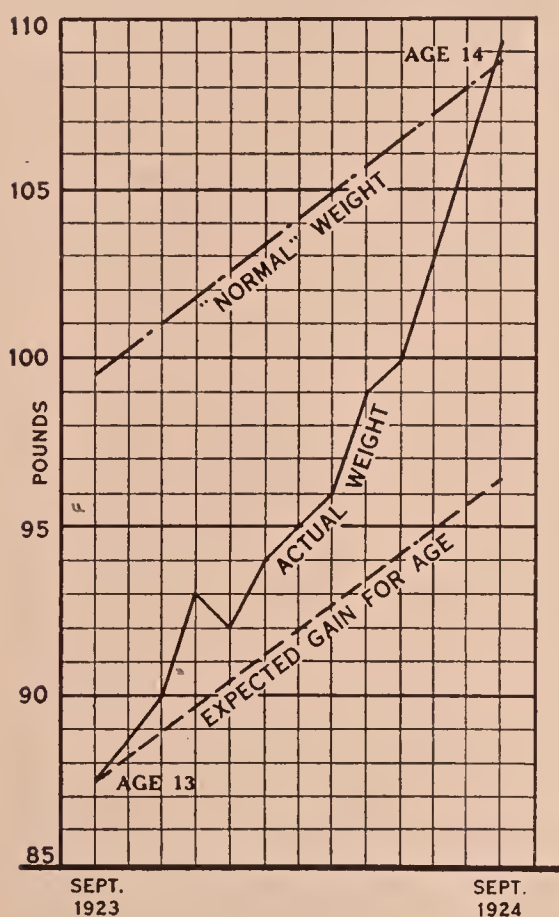
Use paper which is already "squared" for graphs, or rule a sheet of drawing paper for the purpose. The horizontal lines will represent "pounds of weight." The vertical lines will represent the "months" or the times at which weighings are made.

Each horizontal line should be marked with a figure to show the number of pounds, but the numbers will be different for each student because the weights are different. Answer these questions before you plan your graph: What is your actual weight for the first month which you are recording on your graph? What is the average weight for your height and age at that time? Are you overweight or underweight?

If you are underweight, let the fifth horizontal line from the foot of the graph be marked with the number of pounds which represents your *actual weight*. Each horizontal line below should be marked one pound lower and each line above should be marked one pound higher.

If you are overweight, let the fifth horizontal line from the foot of the graph be marked with the number of pounds which represents the *average weight* for your height and age. Mark your lines above and below as directed.

The vertical lines should be marked with the names of the months. *On these lines* dots are placed to indicate weight at weighing periods. The solid black line drawn between these



WEIGHT GRAPH OF A GIRL
WHO CAME UP TO WEIGHT

dots makes a weight line, which falls when you are losing weight and rises when you are gaining.

You can draw a light pencil line to represent your expected gain if you wish. Find out how much a student of your age should gain each month, and draw from the first dot, which represents your actual weight, a line which will show the expected gain per month.

At the time of your first weighing you should be measured and learn the average weight for your height and age. The average weight on your graph may be represented in red. Place a red dot on the proper month line to indicate the average weight for your height and age. If you wish to draw a line from this across the graph, you may draw it on the basis of your expected gain per month, just as you drew your line of expected gain from the dot which showed your actual weight. You may prefer to postpone drawing a line of average weight until you are measured again and find your average weight for the new height. You can then locate a second red dot on the chart, and draw a line connecting the two.

It is possible to make various modifications in weight graphs. Use any form which helps you to watch your growth in an interesting way.

BOARD OF HEALTH ORGANIZATION

During this year when your class is studying community health, you may find it interesting to undertake some of your familiar health activities under a community organization, with a Health Officer and a Board of Health. Most communities have a Board of Health, or some group which corresponds to it, to draw up the health ordinances of the town or city and establish the general policies of the work. The Health Officer or Chairman of the Board of Health, as the case may be, is the executive officer and is responsible for the enforcement of the health ordinances as set by the Board.

Under your Health Officer some of you may serve as commissioners in charge of various activities. Here are some suggestions for such offices: a commissioner of weights and measures, who shall have general charge of whatever weighing and measuring activities are turned over to your class by the teacher; an inspection commissioner to direct the inspections; a housing commissioner to see that desks and chairs are properly adjusted; a safety commissioner to have charge of traffic in halls, on stairways, or at the street crossing in front of the school; a food commissioner to have charge of milk and crackers at recess; a water commissioner to be responsible for the proper use of bubblers and for the cleanliness of sinks; a commissioner on waste disposal to assist in securing high standards of cleanliness in toilets and lavatories. You will think of other divisions of work, perhaps, which your teacher will allow you to undertake, or in which you can assist her by your classroom organization.

Class meetings may be held under the leadership of the Health Officer, and activities for checking and improving individual health habits may be followed somewhat as in Health Club organization. For example, the Commissioner on Weights and Measures, with the assistance of a committee, may prepare a report for the class on the gains in weight at the last weighing, with brief speeches in regard to the most important aids in gaining weight or the most common causes of losing weight. The Safety Commissioner, with the help of a committee, may present a safety play at a meeting of the health class. Other programs will suggest themselves.

The organization of the class is of little importance unless it actually helps to produce better habits and improved health among the pupils. The Health Officer takes pride in a healthy community. Is the health of your class worthy of just pride?

THE MODERN HEALTH CRUSADE

The Modern Health Crusade is a device for class organization which has been developed by the National Tuberculosis Association and used by thousands of schools. Forms and blanks for carrying on the Crusade may be secured from your local or state Tuberculosis Association.

Under the Health Crusade plan, honors are given when you make a certain score in the keeping of health habits. These honors are as follows: Page, Squire, Knight, Knight Banneret, Knight Banneret Constant, and Knight of the Round Table.

Do not let the use of the Modern Health Crusade take the place of weighing and measuring. The Crusade is merely a plan to help children to improve their health habits by checking them very carefully over a definite period.

RECORDING HEALTH HABITS

Instead of keeping a great many records at once, as in the Modern Health Crusade, many classes plan their own records. Each habit record should be kept for at least a two-week period. This sort of record-keeping helps you to watch a few habits definitely, and therefore to fix them more firmly. The advantage of keeping records does not lie in the perfection of the record itself. This is merely a way of reminding one's self to keep the habits until they are firmly established. The test of health habits is shown in your health and your growth. Better habits mean better health and development.

QUESTIONNAIRES

A very good way for a class to find out how much they are "investing" in health habits is to check up by means of a questionnaire. The following questions suggest some that may be included:

1. What time did you go to bed last night?
2. What time did you get up this morning?
3. How many hours of sleep did you have?
4. Was your window open?
5. What did you eat for breakfast this morning?
6. What vegetables did you eat yesterday?
7. What fruit, either raw or cooked, did you eat yesterday?
8. What cereal did you eat yesterday?
9. How many glasses of milk did you drink yesterday?
10. How much water did you drink yesterday?
11. How many cups of tea did you drink yesterday?
12. How many cups of coffee did you drink yesterday?
13. Did you eat candy between meals yesterday?
14. How long did you play out of doors yesterday?

15. How many times did you brush your teeth yesterday?
16. Have you had a full, warm bath during the last week?
17. Did you have a bowel movement yesterday?
18. What health habits have you improved during the past year?

You may prefer to make a questionnaire of your own. You may change some of these questions or add others to the list. Each one should answer the questionnaire frankly, telling exactly what he did, not what he knows he should have done; and then the answers should be scored. It is not necessary that each one should write out the questions on paper. They can be written on the blackboard, arranged in order, with each question numbered. The answers should be numbered in the same way on paper.

The answers to the questionnaire should relate to what each one did yesterday and this morning; they should not be made on the basis of what one *usually* does.

After each pupil has checked his own answers, score each question for the class as a whole. What habits are most carefully practiced? What habits most need improvement? What can be done?

GENERAL HEALTH SCORE CARD

In the use of the general health score card, one scores upon what he believes to be his actual health condition, and upon those habits which he can honestly say are firmly established. Score yourself now and record your total score for future reference. Three months later score yourself again and see whether you have made a better score. Can you make a perfect score? Determine the average score for your class and see whether that improves, too.

HEALTH SCORE CARD FOR BOYS AND GIRLS IN JUNIOR HIGH SCHOOL

*I. Signs of Health**Score*

- | | | | | |
|--|----|--|--|--|
| 1. Can you work and play without being more than naturally tired at bedtime? | 40 | | | |
| 2. Are you rested when you get up in the morning? | 40 | | | |
| 3. Is your appetite for wholesome food good? | 30 | | | |
| 4. Is your weight within 10 per cent below or 20 per cent above average for your height and age? | 40 | | | |
| 5. Have you gained the expected amount for your age since ——? | 50 | | | |
| (Let teacher decide period of time.) | | | | |
| 6. Is your posture good? | 40 | | | |
| 7. Are your feet strong and free from any defect? | 20 | | | |
| 8. Are your muscles strong and firm? | 20 | | | |
| 9. Is your vision either normal or corrected by glasses? | 20 | | | |
| 10. Can you hear ordinary conversation at sixteen feet? | 20 | | | |
| 11. Is your skin clear? Color good? | 20 | | | |
| 12. Is your hair glossy, but free from excessive oil? | 20 | | | |
| 13. Are your teeth either sound or filled? | 30 | | | |
| 14. Are you free from constantly recurring illness, including colds? | 30 | | | |
| 15. Are your nose and throat free from defects, or treated in accordance with medical advice? | 30 | | | |

Score

450

II. Health Practices

- | | | | | |
|---|----|--|--|--|
| 1. Do you drink at least two glasses of milk every day? | 20 | | | |
| 2. Do you eat fruit at least once a day? | 20 | | | |
| 3. Do you eat at least one vegetable, other than potato, every day? | 20 | | | |
| 4. Do you eat an uncooked vegetable at least three times a week? | 20 | | | |
| 5. Do you eat some dark bread every day? | 10 | | | |
| 6. Do you drink at least six glasses of water every day? | 20 | | | |
| 7. Do you refrain from using tea and coffee? | 10 | | | |
| 8. Do you eat sweets in moderation and only at the end of a meal? | 20 | | | |

	Score				
9. Do you eat only at mealtime? (Fruit and milk may be excepted.)	20				
10. Do you eat your meals at a regular time each day?	20				
11. Do you eat slowly and chew your food well?	20				
12. Do you eat a good breakfast, with either cereal or egg as a basis?	20				
13. Do you have a daily scrub with warm water and soap, including at least face, neck, ears, hands and arms, and wash your hands regularly before meals?	10				
14. Do you have a daily tonic bath with cold water in the morning (either shower, tub, or splashing on face, throat, and chest) or a dry rub with a rough towel?	10				
15. Do you take a full warm bath at least twice a week?	10				
16. Do you brush your teeth and gums at least twice a day?	10				
17. Do you clean your finger nails every day and refrain from biting them?	10				
18. Do you average at least ten hours of sleep every night?	30				
19. Do you have a window open?	20				
20. Do you average at least two hours of outdoor exercise every day?	30				
21. Do you have a bowel movement every day?	30				
22. Do you try to maintain your best standing and sitting posture?	20				
23. For school and work do you wear shoes with low, broad heels?	10				
24. Do you remove outdoor clothing when you are indoors — heavy sweaters, suede jackets, rubbers, overshoes?	10				
25. Do you have a complete physical examination by a physician once a year?	50				
26. Do you have your teeth examined and treated by your dentist at least once a year?	40				
27. Have you been vaccinated?	20				
28. Have you been immunized against diphtheria? (Negative Schick Test is O.K.)	20				
Score	550				
TOTAL SCORE	1000				

INSPECTIONS

Daily inspections help to maintain a high standard of personal appearance. The inspection may be part of the morning routine in the home room or it may be associated with the hygiene class or the gymnasium.

The points of inspection are decided by the class and the teacher. The following questions suggest the detail of inspection.

1. Are your face, neck, and ears clean?
2. Have you clean hands and finger nails?
3. Are your nails smooth at the edge and not bitten?
4. Are your teeth thoroughly brushed?
5. Are you dressed properly, without heavy coat or sweater, and without rubbers or overshoes?
6. Are you carrying a clean handkerchief?
7. Is your hair clean and neat?

The procedure of inspection may be somewhat as follows: The inspection commissioner, with the teacher's help, rules off a place at the board where the scores for each team (each row) may be recorded. At the time of inspection the commissioner will record the scores.

Each team elects a captain to inspect them. The captains are inspected either by the teacher or by the inspection commissioner. They examine the members of their teams for the various points of inspection. No team can score unless every member of the team passes.

As the commissioner calls for the reports by teams, the captain reports "Score one" if every member of his team passes the point; if some one has failed to pass, he reports "No score."

DENTAL SCORE CARD							
Defects				Deductions			
Kind	1st date	2nd date	3rd date	Amt.	1st date	2nd date	3rd date
C				— 4			
X				— 10			
X-				— 0			
D				— $\frac{1}{2}$			
O				— 1			
Cr				— 2			
Total Deductions							
Score, 100 — deduction, 1st date =							
Score, 100 — deduction, 2nd date =							
Score, 100 — deduction, 3rd date =							

DENTAL SCORE CARD

The dental score card shown above is used in the junior high schools of Cleveland, Ohio; the description given here is taken directly from their *Tentative Health Program for Junior High School*:

“ The following values for scoring dental defects have been developed by the Mouth Hygiene Bureau. When the pupil

examines his record and finds one or more C's he should know that he has that many carious or decayed teeth. The number of C's should be recorded on the score card under 'Defects, 1st date.' From a perfect score of 100 points deduct 4 points for each carious tooth. To determine the amount to be recorded under 'Deductions, 1st date,' the number of C's should, therefore, be multiplied by 4. The X's indicate the number of pathological or infected teeth which require extraction, and 10 points are deducted for each X. The X- indicates a loose tooth and no deduction is made for it; but for D's, which represent fillings, a half-point each should be deducted. For each O, missing tooth, deduct 1 point, and for each Cr, crown, 2 points.

"During the term, if the dental defects are corrected, the total deduction will decrease. The corrections will be indicated if examinations are made on second and third dates. Since slight deductions are made for fillings and for missing teeth the score can never equal 100 points, but each correction will raise the score."

STUDENT COUNCIL

If there is a Student Council in your school, it may contribute a great deal to the health activities. The Board of Health organization may be connected with the Student Council in some way which permits them to work coöperatively. Here are some of the activities which are sometimes carried on through the leadership of the Student Council:

1. Promoting better habits of living through campaigns on health, using plays, posters, or four-minute speeches.
2. Encouraging personal neatness by issuing regular reports on the highest class scores for daily inspection.

3. Encouraging neatness in handling materials by weekly inspection of students' lockers and desks.
4. Maintaining a high degree of neatness about the building by daily inspection of floors, toilet rooms, and playground.
5. Promoting safety by constant watchfulness through a safety committee and through publicity in regard to safety.

USE OF SCHOOL NEWSPAPER

Health items are of general interest, and the school newspaper may contribute valuable assistance in the health program by publishing timely information and publicity material. Here are some examples of health items for the newspaper:

1. A special health column, including information about health, illustrated health slogans, and answers to health questions.
2. News items, including reports on visits to places like the Health Department, the State Vaccine Laboratory, or a fresh-air camp; reports of surveys made in the school — as, for example, a survey of food selection made in the lunch room, of types of shoes worn, of sleeping habits; items telling about health activities carried on in special departments, such as poster making or campaigns for better teeth.
3. Editorials setting forth the importance of health for success and happiness and commenting on the health activities of the school.

BULLETIN BOARD

If you have bulletin boards you will doubtless be interested to display health material from time to time. Here are some suggestions:

1. Health posters and slogans made in the art department.
2. Clippings from newspapers and magazines.
3. News of a health campaign or special activity being carried on by the students.

HEALTH EDUCATION IN RELATION TO OTHER SUBJECTS

Health is such a far-reaching factor in life that the student finds throughout many of his subjects an opportunity to broaden his health knowledge. Notice how the history of different peoples is associated with health. In geography, observe how climatic conditions and natural resources affect habits of living, customs, and industries. Social science, or civics, emphasizes constantly the importance of personal and community health as a prime factor in community life.

General science gives you basic knowledge. The physical-education program contributes directly to the health of the students. Is each student profiting to the utmost by taking part in all those activities for which he is qualified? You should regard your ability in physical education as one measure of good development and health.

Home economics is another subject which directly teaches health. Girl students should be appreciative of the opportunity to learn scientific facts about diet and care of the home. Is there any chance for boys to be instructed in a knowledge of foods and cooking which will aid them in camping?

HEALTH HABIT OBJECTIVES

The following list of health habit objectives is adapted from the Cleveland *Tentative Health Education Program for Junior High School*.

Growth and Health

1. To determine one's weight regularly.
2. To plan a health-training program of the essential daily health habits.
3. To live within one's own physical limitations.

*Mouth and
Teeth*

4. To brush the teeth at least twice daily in an approved way.
5. To brush the gums and tongue properly.
6. To use a toothbrush of the proper size, shape, and stiffness.
7. To use one's own toothbrush.
8. To care for the toothbrush properly. (Rinse thoroughly in hot water.)
9. To refrain from biting hard objects.
10. To keep all foreign objects out of the mouth (pencils, fingers, money, etc.) (See also, *Hands*)
11. To refrain from picking the teeth with pins.
12. To select a diet rich in tooth-building material.
13. To visit a dentist twice a year.
14. To refrain from kissing any one on the mouth.

Posture

15. To hold the body in an erect position when standing, walking, or sitting.

*Food and
Habits of
Eating*

16. To acquire a taste for milk, green vegetables, hard dark breads, and whole-grain cereals.
17. To refrain from eating an excess of food.
18. To include sufficient bulky food in the diet.
19. To include sufficient hard food in the diet.
20. To avoid sweets or to eat them rarely and never except at the end of a meal.
21. To limit the amount of protein in the diet.
22. To choose the most healthful meats.
23. To avoid eating fried foods.
24. To avoid food fads (hot-water fad, no-breakfast fad, raw-food fad).
25. To eat a simple warm lunch daily.
26. To use iodized salt at home (if you live in a goiterous district).
27. To eat a good breakfast each morning.
28. To refrain from eating between meals, especially heavy foods and sweets.
29. To take the heavy meal at the most healthful time of day.
30. To avoid eating when hurried or excited.
31. To eat three regular meals a day.

32. To drink plenty of water between meals.
33. To avoid ice water or drink only small portions.
34. To drink a glass of water before breakfast.
35. To use individual cups.
36. To use drinking fountain properly. (See also, *Sanitation*)
37. To drink slowly.
38. To refrain from using soft drinks, except at meals and then rarely.
39. To take small bites and mouthfuls.
40. To eat slowly and to chew food well.
41. To refrain from drinking while food is in the mouth.
42. To rest before and after eating when possible. (See also, *Rest*)
43. To sit properly at the table.
44. To be calm, cheerful, and polite at the table.
45. To refrain from talking while food is in the mouth.
46. To wash hands before handling food or eating. (See also, *Hands*)
47. To refrain from exchanging food or from eating food picked up from the floor, ground, or street.
48. To wash or peel fruit before eating it.
49. To wash dishes properly after using them.
50. To use one's own napkin.
51. To refrain from handling other people's food.
52. To protect food from dust, flies, and rodents.
53. To handle and store fresh and prepared food properly.

*Elimination of
Body Waste*

54. To evacuate the bowels at least once daily at a regular time, preferably just after breakfast.
55. To take sufficient water to aid digestion and elimination.
56. To take sufficient bulky food to aid elimination. (See also, *Food*)
57. To take sufficient active exercise each day as an aid to elimination.
58. To use toilets and lavatories in a sanitary way.
59. To avoid the abuse of cathartics.

Skin

60. To take a cleansing bath at least twice a week, preferably daily.
61. To wash the face, neck, and ears daily with warm water and soap.

- 62. To rinse and dry the skin thoroughly.
- 63. To use one's own towel and wash cloth and keep them clean.
- 64. To provide skin stimulation in the form of cold bath, showers, or cold water on face, neck, and chest, followed by a brisk rub, or a dry rub with a rough towel.
- 65. To care for roughness of the skin and chafing due to unavoidable exposure.

Hands

- 66. To wash hands before eating or handling food. (See also, *Food*)
- 67. To wash hands after using toilet.
- 68. To keep nails short and clean.
- 69. To refrain from biting nails or picking hangnails.
- 70. To refrain from putting fingers into the mouth. (See also, *Mouth*)
- 71. To prevent or care for hangnails.
- 72. To keep one's hands clean when giving first aid.
- 73. To use one's own manicure articles.

Hair

- 74. To brush and comb the hair daily.
- 75. To use one's own comb and brush and to keep them clean.
- 76. To have the hair washed at least once in two weeks.
- 77. To dry the hair thoroughly before going out.
- 78. To massage the scalp by brisk brushing or rubbing.
- 79. To keep the hair trimmed or tied so that it does not hang in the eyes.
- 80. To prevent dandruff.
- 81. To prevent pediculosis.
- 82. To avoid useless and harmful tonics.

*Fresh Air,
Ventilation,
and Sunshine*

- 83. To sleep with windows open at top and bottom.
- 84. To maintain proper ventilation in rooms over which one has control.
- 85. To avoid breathing dry, dusty air.
- 86. To avoid breathing fumes.
- 87. To avoid overcrowded and poorly ventilated places.
- 88. To breathe properly with mouth closed and abdomen contracted.

- 89. To get abundant sunshine into the home.
- 90. To expose the skin to sunlight (to become tanned but not burned).
- 91. To work and study in well-ventilated rooms.
- 92. To choose outdoor recreation when possible.

Nose

- 93. To breathe through the nose with the mouth closed.
- 94. To blow the nose gently, one nostril at a time.
- 95. To use only one's own handkerchief.
- 96. To use a clean handkerchief.
- 97. To avoid picking the nose.
- 98. To cover coughs and sneezes with a clean handkerchief.

Disease

- 99. To obey quarantine regulations.
- 100. To submit to vaccination against smallpox, typhoid fever, and diphtheria.
- 101. To keep away from those who are ill with communicable diseases.
- 102. To prevent colds.
- 103. To treat colds properly.
- 104. To be careful during convalescence.
- 105. To practice those health habits which will protect against tuberculosis infection.
- 106. To prevent the spread of skin diseases and infections.

Sanitation

- 107. To help keep the schoolroom clean.
- 108. To keep work material clean.
- 109. To keep one's desk, shelves, and drawers clean.
- 110. To help keep the school grounds, home yards, streets, alleys, and also parks and camp sites, clean.
- 111. To help maintain sanitary conditions of school and other public toilets.
- 112. To maintain sanitary conditions of kitchen, bath, and bedroom.
- 113. To have screen doors shut.
- 114. To dispose of household waste and garbage, using proper receptacles.
- 115. To use the drinking fountain properly. (See also, *Food*)
- 116. To use the telephone properly.
- 117. To handle money properly.
- 118. To help to prevent the breeding of flies and mosquitoes.

Harmful Substances

- 119. To refrain from drinking tea and coffee during the growth of the body.
- 120. To refrain from drinking alcoholic beverages.
- 121. To refrain from using any form of tobacco.
- 122. To take medicine only according to the doctor's instruction (home remedies excepted).

Sleep and Rest

- 123. To have a regular bedtime.
- 124. To sleep outdoors or with windows open.
- 125. To sleep without artificial light in the room.
- 126. To take a relaxed position for sleeping or resting.
- 127. To use a low pillow or no pillow.
- 128. To use sufficient light warm cover but not too much.
- 129. To relax during rest periods at school or at home.
- 130. To provide for sufficient rest and relaxation during the day.
- 131. To rest after eating when possible. (See also, *Food*)
- 132. To eat only light meals before sleeping.
- 133. To avoid intense mental activity or excitement just before retiring (to have a quiet evening).
- 134. To air bed clothing each morning.
- 135. To confine parties to one week-end night.
- 136. To sleep alone in one's own bed and in one's own room if possible.
- 137. To remove clothing at night.
- 138. To sleep in hygienic night clothing.
- 139. To change sheets and pillow slips each week.

Clothing

- 140. To choose clothing of suitable size and style, suspended from the shoulders.
- 141. To have clothing suitably adjusted for comfort and vigorous activities (no restraining bands or elastics).
- 143. To keep clothing as clean as possible.
- 143. To keep shoes clean and polished.
- 144. To have clean underclothing and stockings at least twice a week (preferably oftener).
- 145. To refrain from getting clothing wet if possible, and to remove damp clothing as soon as possible and warm the body if it has been chilled.
- 146. To adjust the amount of clothing worn to the temperature and the weather.

- 147. To remove extra wraps, sweaters, and rubbers when indoors.
- 148. To avoid waterproofed material for constant wear.
- 149. To wear underclothing suitable to climate and season.
- 150. To avoid excessive neckwear and furs.
- 151. To put on extra wraps when one is warm after exercise.
- 152. To keep wraps and clothing neatly and in a proper place.
- 153. To remove all clothing at night, spread it to air, and put on night clothes.
- 154. To select hats that are ventilated and not too tight.
- 155. To wear light-colored clothing during the summer.

Feet

- 156. To wash feet regularly.
- 157. To keep the nails short and clean.
- 158. To prevent ingrowing toe nails by trimming them squarely, scraping thin on top, and wearing proper shoes.
- 159. To wear stockings of proper size.
- 160. To wear shoes of proper size and shape (straight inner edge and low, flat heel).
- 161. To wear rubbers at appropriate times.
- 162. To remove overshoes indoors.

Eyes

- 163. To read only in proper light.
- 164. To hold book or handwork in correct position and at proper distance from eyes.
- 165. To avoid casting a shadow upon one's writing or handwork.
- 166. To refrain from looking directly at the sun or extremely bright lights (wear eye shade when necessary).
- 167. To avoid glare.
- 168. To wear dark glasses when glare is unavoidable.
- 169. To avoid excess of fine work.
- 170. To rest the eyes frequently or when tired by closing them or focusing them on distant objects.
- 171. To avoid reading while lying down.
- 172. To avoid reading on moving cars.
- 173. To avoid sitting too close to the screen at the movies.
- 174. To avoid reading fine print, blurred letters, etc.

- 175. To secure properly fitted glasses when necessary and to wear them according to the oculist's directions.
- 176. To have a periodic examination of one's eyes.
- 177. To keep frames of glasses properly adjusted (not bent).
- 178. To keep the lenses clean.
- 179. To refrain from rubbing the eyes, and to keep inappropriate articles away from them.
- 180. To remove properly any foreign objects from the eyes.
- 181. To secure medical advice when there is trouble with the eyes.
- 182. To bathe the eyes when they are sore or tired.

Ears

- 183. To wash the ears carefully.
- 184. To refrain from putting anything into the ears.
- 185. To refrain from shouting into or pulling other people's ears.
- 186. To avoid blowing the nose forcibly, in order to prevent possible injury to the ears.
- 187. To secure medical advice when there is trouble with the ears.
- 188. To protect the ears when swimming.

Safety

- 189. To develop practices of safety.

WEIGHT—HEIGHT—AGE TABLE FOR GIRLS

Height Inches	5 Yrs.	6 Yrs.	7 Yrs.	8 Yrs.	9 Yrs.	10 Yrs.	11 Yrs.	12 Yrs.	13 Yrs.	14 Yrs.	15 Yrs.	16 Yrs.	17 Yrs.	18 Yrs.
38	33	33												
39	34	34												
40	36	36	36											
41	37	37	37											
42	39	39	39											
43	41	41	41	41										
44	42	42	42	42										
45	45	45	45	45	45									
46	47	47	47	48	48									
47	49	50	50	50	50	50								
48		52	52	52	52	53	53							
49		54	54	55	55	56	56							
50		56	56	57	58	59	61	62						
51			59	60	61	61	63	65						
52			63	64	64	64	65	67						
53			66	67	67	68	68	69	71					
54				69	70	70	71	71	73					
55				72	74	74	74	75	77	78				
56					76	78	78	79	81	83				
57					80	82	82	82	84	88	92			
58						84	86	86	88	93	96	101		
59						87	90	90	92	96	100	103	104	
60						91	95	95	97	101	105	108	109	111
61							99	100	101	105	108	112	113	116
62							104	105	106	109	113	115	117	118
63								110	110	112	116	117	119	120
64								114	115	117	119	120	122	123
65								118	120	121	122	123	125	126
66									124	124	125	128	129	130
67									128	130	131	133	133	135
68									131	133	135	136	138	138
69										135	137	138	140	142
70										136	138	140	142	144
71										138	140	142	144	145

Prepared by Bird T. Baldwin, Ph.D., and Thomas D. Wood, M.D.

About what a G I R L should gain each month.

Age

Age

5 yrs. to 8 yrs. 6 oz.

14 yrs to 16 yrs 8 oz.

8 " " 11 " 8 "

16 " " 18 " 4 "

11 " " 14 " 12 "

Courtesy of the American Child Health Association

WEIGHT—HEIGHT—AGE TABLE FOR BOYS

Height Inches	5 Yrs.	6 Yrs.	7 Yrs.	8 Yrs.	9 Yrs.	10 Yrs.	11 Yrs.	12 Yrs.	13 Yrs.	14 Yrs.	15 Yrs.	16 Yrs.	17 Yrs.	18 Yrs.	19 Yrs.
38	34	34													
39	35	35													
40	36	36													
41	38	38	38												
42	39	39	39	39											
43	41	41	41	41											
44	44	44	44	44											
45	46	46	46	46	46										
46	47	48	48	48	48										
47	49	50	50	50	50	50									
48		52	53	53	53	53									
49		55	55	55	55	55	55								
50		57	58	58	58	58	58	58							
51			61	61	61	61	61	61							
52			63	64	64	64	64	64	64						
53			66	67	67	67	67	68	68						
54				70	70	70	70	71	71	72					
55				72	72	73	73	74	74	74					
56				75	76	77	77	77	78	78	80				
57					79	80	81	81	82	83	83				
58					83	84	84	85	85	86	87				
59						87	88	89	89	90	90	90			
60						91	92	92	93	94	95	96			
61							95	96	97	99	100	103	106		
62							100	101	102	103	104	107	111	116	
63							105	106	107	108	110	113	118	123	127
64								109	111	113	115	117	121	126	130
65								114	117	118	120	122	127	131	134
66									119	122	125	128	132	136	139
67									124	128	130	134	136	139	142
68										134	134	137	141	143	147
69										137	139	143	146	149	152
70										143	144	145	148	151	155
71										148	150	151	152	154	159
72											153	155	156	158	163
73											157	160	162	164	167
74											160	164	168	170	171

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About what a B O Y should gain each month.

Age

5 yrs. to 8 yrs. 6 oz.

8 " " 12 " 8 "

Age

12 yrs. to 16 yrs. 16 oz

16 " " 18 " 8 "

Courtesy of the American Child Health Association

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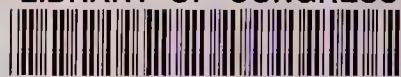
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